DESCRIPTIONS OF SEVEN SUPPOSED NEW NORTH AMERICAN BIRDS.*

BY WILLIAM BREWSTER.

Megascops asio aikeni,† new subspecies. AIKEN'S SCREECH OWL.

SUBSPEC. CHAR. — Of about the size of *M. bendirei*, with the ground color more ashy; the dark markings coarser, and more numerous and conspicuous, than in any other North American member of the genus.

Female ad. (No. 7503, collection of William Brewster, El Paso County, Colorado, May 29, 1872; C. E. Aiken).— Ground color of both upper and lower parts plain ash-gray; the legs, flanks, under tail-coverts, crown, and back and sides of neck, white, mixed with gray on the crown and faintly tinged with dull vinaceous on the scapulars and back; outer edges of outer scapulars and wing-coverts pure white, the former narrowly tipped and margined with black; the usual light spots and bars on primaries and secondaries whiter than in most members of the genus but not as conspicuous as in *M. maxwelliæ*; tail obscurely banded with ashy or rusty white; feathers of the face with numerous fine bars of reddish brown; lores and superciliary region soiled white, the shafts and tips of most of the feathers black or dark brown; wing-coverts, scapulars, top of head, hind neck, back, breast, sides, and abdomen with broad, coarse, mesial streaks and stripes of dull black, these very conspicuous everywhere but most so on the top of head, wing-coverts, and breast; legs, flanks, and under tail-coverts with obscure transverse spots and bars of reddish brown; remainder of under parts with fine, but very regular and distinct, blackish bars which form lateral offshoots of the mesial streaks; under wing-coverts tawny with obscure brownish mottling. Wing 6.56; tail, 3.80; tarsus, 1.37; bill from nostril, .47 inch.

The specimen just described bears a somewhat close general resemblance to my type of *M. aspersus* (from Mexico), but is considerably larger and lacks the rusty chestnut of the throat and neck and the conspicuous bearding of the auriculars and superciliary tufts. The under parts, also, are ashier, and the markings generally finer although much coarser than in any of the more northern forms. Indeed in the dark ground color of the under parts and the excessively coarse, abundant streaking both above and beneath the bird differs so widely from all of the latter, that I am quite at a

* An author's Edition of 100 copies of this paper was published Feb. 17, 1891.—ED.

†Named for Mr. Charles E. Aiken of Colorado Springs, Colorado.

loss to suggest its probably nearest affine among them. I had the skin of Mr. Aiken who, if I remember aright, asserted that it was a fair representative of the form which inhabits cottonwood timber along streams in the plains region about Colorado Springs, *maxwelliæ*, of which he showed me several typical specimens, being confined to the neighboring mountains. According to Capt. Bendire, however, the latter form has been found breeding in cottonwoods on the Platte River within six miles of Denver (Auk, VI, October, 1889, p. 298).

Megascops asio macfarlanei,* new subspecies. MACFARLANE'S SCREECH OWL.

SUBSPEC. CHAR.— Of the size of *M. kennicotti*, but with the color and markings of *M. bendirei*.

Female ad. (No. 6456, collection of William Brewster, Fort Walla Walla, Washington, October 22, 1881; Capt. Charles E. Bendire, U. S. A.).— Ground color above brownish ash tinged with vinaceous, darkest on the head and back, palest on the wings, with confused, often nearly obsolete, transverse bars and longitudinal shaft stripes of dull black, broadest and most numerous on the crown; outer edges of scapulars and alula-coverts cream color, the former tipped and narrowly margined with black; secondaries and inner webs of primaries crossed by six or seven bars of pale reddish brown or rusty white; outer webs of primaries with broad, quadrate spots of brownish white; tail regularly but faintly barred with light reddish brown; feathers of the sides of head and neck thickly but finely mottled with dusky on a lighter ground; lores nearly pure white, but the shafts and tips of the feathers dusky or brownish; a somewhat broken, facial circle of black and chestnut spots and blotches; beneath ashy white, lightest on the abdomen, with numerous, fine, regular, transverse bars of black and coarse shaft-stripes of the same color, many of these bars and stripes bordered with pale rusty, the only immaculate space being the middle of the abdomen, which is creamy white; lining of wings and concealed silky plumage of sides under the wings pale ochraceous; some of the under wing-coverts barred with brown; feathering of legs dull rusty chestnut, faintly barred with reddish brown. Wing, 7.23; tail, 3.85; tarsus, 1.67; length of bill from nostril, .57 inch.

Male ad. (No. 6457, collection of William Brewster, Fort Walla Walla, Washington, November 20, 1881; Capt. Charles E. Bendire, U. S. A.).— Similar to the female, but smaller, the dark markings coarser and better defined. Wing, 6.96; tail, 3.80; tarsus, 1.50; length of bill from nostril, .53 inch.

*Named, at Capt. Bendire's request, for Mr. Robert MacFarlane who, as is well known, was a personal friend of Robert Kennicott and an enterprising and accomplished field ornithologist.

Habitat. — Fort Walla Walla, Washington; Hellgate, Montana; and probably the entire intermediate region, and northward into the interior of British Columbia.

Megascops asio saturatus, new subspecies. PUGET SOUND SCREECH OWL.

SUBSPEC. CHAR.—Similar to *M. a. kennicotti* but smaller, the general coloring darker and less tawny, the face and under parts with much more white. *Dichromatic.*

Gray phase. Female ad. (No. 25,846, collection of William Brewster, Victoria, British Columbia, February 18, 1889; from E. H. Forbush.). — Upper parts nearly uniform dark slate-gray with the slightest possible reddish tinge, the plumage everywhere so thickly streaked, barred, and vermiculated with dull black as to obscure the ground color, the markings, particularly the shaft stripes, coarsest and most regular on the crown and nape but nowhere sufficiently contrasted with the general coloring to be at all conspicuous: ear-tufts, nape, and sides of neck with concealed pale rusty or fulvous white disposed in irregular stripes or blotches on both webs of the feathers; a broad, dull black bar on each side of the head extending from the base of the ear-tufts over the tips of the auriculars nearly to the throat; outer webs of outer scapulars and some of the outer wing-coverts fulvous white, the former tipped and narrowly edged with black; secondaries and inner webs of primaries crossed by six or seven bars of grayish ash tinged slightly with fulvous, these bars so pale and indistinct on the primaries as to be nearly obsolete; outer webs of primaries with quadrate spots of dull rusty white with dark brown centres; tail with faint and irregular transverse bars of ashy white tinged with rusty; anterior half of orbital region plain clove-brown; superciliary line and lores white, the feathers dusky or blackish towards their tips; remainder of facial disc ashy white with numerous fine, transverse markings of clove-brown; under parts clear ashy white, tinged with rusty on the jugulum, flanks, and legs, very faintly with fulvous on the breast, the plumage everywhere, including the abdomen and under tail-coverts, with coarse, sharply defined, longitudinal stripes and fine, wavy, transverse bars of black, the former very broad and conspicuous on the breast; under wing-coverts fulvous, thickly but obscurely barred with clove-brown; feathering of legs mottled and barred with reddish brown. Wing, 6.87; tail, 3.65; tarsus, 1.50; length of bill from nostril, .52 inch.

Ferruginous phase. Male ad. (No. 25,845, collection of William Brewster, Victoria, British Columbia, November 24, 1888; E. H. Forbush).— Markings closely similar to those of the bird just described but with the ground color of the entire upper parts tinged with tawny or rusty cinnamon, bringing out the black streaks and bars in sharper relief; cheeks, jugulum, breast and sides with more rusty than in the female, but the ground color of the superciliary region, lores, chin and entire abdomen,

essentially pure white. Wing, 6.70; tail, 3.65; tarsus, 1.50; length of bill from nostril, .47 inch.

Habitat.—Shores and islands of Puget Sound, and southward, along or near the coast, to Salem, Oregon.

In a paper published* about nine years ago I referred some large Screech Owls taken at Fort Walla Walla by Capt. Bendire to *Megascops kennicotti*, assuming that they represented a hitherto unrecognized gray phase of the latter. At the time this seemed to be a reasonable hypothesis, for my material showed that the gray and brown forms were connected by intermediates, and indicated that neither style of coloration was peculiar to any particular portion of the general region which my specimens represented. Since then, however, I have become convinced, by examination of a large number of skins from various localities in Oregon, Washington and British Columbia, that the gray bird found at Fort Walla Walla and elsewhere in the dry, elevated region east of the Cascade Mountains is really a distinct subspecies. It will be remembered that among my chief reasons for originally thinking it merely a gray phase of *kennicotti* were the facts that a specimen in the National Museum collection labelled as collected in Idaho, by Dr. Whitehead, was nearly as brown as the type of *kennicotti*, while I had what seemed to be the gray bird from Portland, Oregon. I am now assured by Capt. Bendire, however, that the label of the supposed Idaho specimen is not to be trusted and that the bird was undoubtedly taken near the mouth of the Columbia River where Dr. Whitehead was for some time stationed. Moreover the form of *Megascops* found on and near the coast of Oregon, is shown by examination of more material to be much smaller and, as a rule, differently colored from that occurring east of the Cascade Mountains. Furthermore, I now have the gray phase of the coast form and it proves to be very unlike the Walla Walla birds. Hence my original reference of the latter to *kennicotti* cannot be longer sustained.

As will appear from the diagnosis and description, *M. macfarlanei* resembles *M. bendirei* very closely in general color and markings. Indeed the only constant difference is that of size, but this is so marked that there is no difficulty whatever in separating specimens which come from well within the respective habitats of

* Bull. Nutt. Orn. Club, VII, Jan. 1882, pp. 27-33.

the two forms. It is to be expected, of course, that the birds will prove to intergrade at points where they approach one another, a probability already indicated by a specimen (No. 16,027) in the National Museum from Fort Crook, northern California, which is about intermediate in size, between the types of *bendirei* and *macfarlanei*. I am informed by Capt. Bendire that there is quite as appreciable a difference in size between the eggs of these Owls as between the skins, the average measurements of twenty-six eggs of *M. bendirei* in his (the National Museum) collection being 35 × 30 mm. with extremes of 36 × 32 mm. and 32 × 28 mm., against the average 37.5 × 32 mm., and extremes of 39 × 33.5 and 35 × 31.5 mm., of twenty-seven eggs of *M. macfarlanei*.

M. saturatus is dichromatic. In its gray phase, which is represented by two specimens (including the type) before me it is strikingly different from any other form of the genus which I have examined. At first sight the upper parts appear to be nearly uniform dark slaty brown with the faintest possible tinge of reddish and some dull black shaft stripes on the feathers of the top of head and hind neck besides a little half concealed rusty fulvous on the ear-tufts and nape; but closer inspection reveals innumerable black or blackish markings very generally distributed but so confused and crowded and so slightly contrasted against the dark background as to be nowhere conspicuous. The ground color of the under parts is essentially ashy white with a little rusty on the jugulum and a slight tinge of fulvous on the breast and sides.

In the red phase the upper parts are much as in *kennicotti*, but the tawny or rusty is less pronounced and the general coloring deeper and duller, while the wings and tail are more ashy. The best distinction, however, consists in the much greater amount of white on the face and under parts, especially on the superciliary region, lores, chin, and abdomen, which are nearly or quite free from any tawny tinge. All the specimens from Victoria are considerably smaller than the type of *kennicotti*, but one from New Westminister is larger although in other respects it is typical *saturatus*.

It is possible, of course, that the type* of *kennicotti* is aber-

* I have seen no Alaskan specimens except this type, and am not aware that any exist in collections.

rant in respect to the characteristics just named, but as the Song Sparrow found at Sitka represents a distinct subspecies from that which occurs about the lower portions of Puget Sound there seems to be a strong probability that the equally plastic and still more sedentary Screech Owls of these regions possess quite as constant differences. There is, indeed, an apparent and very interesting analogy, in respect to relative size, coloring and habitat, between *Megascops kennicotti et saturatus* and *Melospiza rufina et guttata*, while to some extent, but less closely, *Megascops macfarlanei* corresponds with *Melospiza montana*, and *Megascops bendirei* with *Melospiza samuelis*.

Contopus richardsonii peninsulæ, new subspecies. LARGE-BILLED WOOD PEWEE.

SUBSPEC. CHAR.—Much smaller than *C. richardsonii* but with the bill actually, as well as relatively, longer and broader, the color of the upper parts slightly grayer, the yellowish of the throat and abdomen clearer or less brownish and more extended, the pectoral band narrower and grayer, the light edging of the inner secondaries and greater wing-coverts broader and whiter.

Male ad. (No. 16,790, collection of William Brewster, Sierra de la Laguna, Lower California, May 9, 1887; M. Abbott Frazar).—Above, with the sides of the head, neck, and breast, dull grayish brown faintly tinged with olive; wings and tail clove-brown, with the inner secondaries broadly edged and tipped with ashy white, the greater and middle wing-coverts with brownish white; feathers of the crown with dark (clove-brown) centres; median under parts pale straw-yellow, almost primrose-yellow on the abdomen, the breast crossed by a narrow band of brownish gray, the sides also grayish. Wing, 3.30; tail, 2.38; tarsus, .52; bill, length from nostril, .42; width at nostril, .31 inch.

Female ad. (No. 16,777, collection of William Brewster, Triumfo, Lower California, June 13, 1887; M. Abbott Frazar).—Similar to the female above described, but smaller, the yellow of the under parts paler. Wing, 3.00; tail, 2.29; tarsus, .50; bill, length from nostril, .42; width at nostril, .30 inch.

Habitat.—Sierra de la Laguna, Lower California.

In the coloring of the under parts this form resembles *C. virens*, the yellowish of the throat and abdomen being of about the same shade and fully as extended as in that species. The breast and sides, however, are less olivaceous and more as in *richardsonii*, but grayer, with the pectoral band almost invariably narrower. The

coloring of the upper parts is essentially similar to that of *richardsonii*, but perhaps a trifle paler. The wings and tail are much shorter or about as in *virens*. The bill averages considerably larger (both longer and broader) than in either *virens* or *richardsonii*. *C. richardsonii* is subject to a good deal of geographical variation in respect to size, the birds in my series from the Sierra Nevada and Rocky Mountain regions being much larger than those from the coast of California and the Sierra Madre of Mexico. The wings and tail of the latter average scarcely, if at all, longer than in *C. peninsulæ*, but their bills are rather smaller than those of the Rocky Mountain and Sierra Nevada birds, instead of being much larger, as is the case with *peninsulæ*. It must be admitted that none of the differences just enumerated are perfectly constant, but with birds of the same sex and age they serve to distinguish fully ninety-five per cent of the large series (over one hundred specimens) collected in Lower California by Mr. Frazar.

Ammodramus henslowii occidentalis, new subspecies. WESTERN HENSLOW'S SPARROW.

SUBSPEC. CHAR.—Similar to *A. henslowii* but the general coloring paler above and whiter beneath, the back and scapulars with broader black streaking and much less chestnut, the wings and tail grayer.

—— *Adult.* (No. 25,959, collection of William Brewster, Moody County, Dakota, June 16, 1882; F. T. Jencks).—Top of head and nape pale grayish olive; forehead and crown with a broad stripe of black spots on each side; mind neck more finely and sparsely spotted; wing-coverts, scapulars, and feathers of the back with coarse, central streaks of dull black bordered outwardly with a little pale chestnut, this shading quickly into grayish white which forms a broad margin on all these feathers; wing-coverts, quills, and tail-feathers faded brown, edged rather broadly with brownish white and tinged with chestnut on the inner secondaries and towards the bases of the rectrices; upper tail-coverts pale chestnut with narrow shaft streaks of dark brown; under parts dull white with fine black spots and streaks on the breast and sides and broader ones on the flanks, which are slightly tinged with reddish brown; sides of head buffy white with a little yellow above the eye and two narrow, black, mandibular stripes, and one postocular, on each side, besides an obscure black crescent or spot behind the auriculars; shoulders tinged with greenish yellow, and bend of wing yellowish white.

Wing, 2.18; tail, 1.95; tarsus, .69; bill, length from nostril, .31; depth at nostril, .32 inch.

Habitat. — Dakota, — and probably other regions along the eastern border of the Great Plains.

Two other specimens in my collection, taken in the same locality at nearly the same date, are similar in every respect save that one has a trifle more chestnut on the back although much less of this than have any of the large number of Eastern birds before me. Several examples from Illinois are a shade paler than those from the Atlantic States, but I refer them all, without hesitation, to *henslowii*. Massachusetts specimens are nearly as white beneath as *occidentalis*, but their upper parts are marked and colored like those of the birds that breed near Washington, D. C., which probably most nearly represent true *henslowii*.

Pipilo maculatus magnirostris, new subspecies. MOUNTAIN TOWHEE.

SUBSPEC. CHAR.— Similar to *P. m. megalonyx*, but with the bill much larger, the rufous of the under parts paler, the upper parts browner and tinged with olive. Female very decidedly lighter than the male.

Male ad. (No. 16,070, collection of William Brewster, Sierra de la Laguna, Lower California, May 21, 1887; M. Abbott Frazar). Upper parts generally, with the head and neck all around to the upper part of the breast, dull black, the back and rump mixed with brownish olive, the wing quills dark olive brown; white markings of the back, scapulars, wing-coverts, wings, and tail, about as in typical *megalonyx*; middle of breast and belly white; sides rusty ochraceous; flanks and under tail-coverts brownish buff. Wing, 3.37; tail, 3.85; tarsus, 1.08; length of bill from nostril, .42; depth of bill at nostril, .40 inch.

Female ad. (No. 16,081, collection of William Brewster, Sierra de la Laguna, Lower California, May 21, 1887; M. Abbott Frazar).— Similar to the male just described but with the black everywhere replaced by grayish brown, tinged with olive on the back, darkest on the upper part of the breast; feathers of the crown streaked centrally with orange rufous. Wing, 3.28; tail, 3.71; tarsus, 1.07; length of bill from nostril, .41; depth of bill at nostril, .39 inch.

Habitat.—Cape St. Lucas Region of Lower California.

The proper assignment of the Towhees of the *P. maculatus* group taken by Mr. Frazar in Lower California is a matter of some difficulty. With respect to the white spotting of the scapulars, wings, and tail, they agree very well with *megalonyx*. But the rufous of the flanks, sides, etc., is quite as pale or ochraceous

as in *arcticus*. The female is very like that of the form last mentioned, instead of being nearly as dark as the male, as is the case with the female of *megalonyx*. Only two of my seventeen males have the back black, the feathers of this part in all the others being more or less broadly edged with brownish or olivaceous. Both males and females have the bill uniformly much larger and stouter than in any of my specimens of the allied forms from the United States. Some of the peculiarities just mentioned, including the heavy bill, can be very closely matched in a series of breeding specimens from the mountains of Chihuahua, Mexico, but none of the latter are as pale on the flanks and sides. Mr. Ridgway, who has examined these Chihuahuan birds, pronounces them to be intermediate between *megalonyx* and *maculatus*. The Lower California examples might be similarly disposed of, but in view of their isolated habitat and the fact that they exhibit a *combination* of characters unlike that of any form hitherto recognized and fairly constant, I have thought them entitled to subspecific separation.

The orange rufous streaking on the crown of the female above described is found on several other birds (all females) in my series and on one or two constitutes a conspicuous and rather ornamental marking. As it is wholly lacking on many Lower California birds it cannot be taken as a diagnostic character, although I find no trace of it in any of the other forms of the *maculatus* group.

Vireo solitarius lucasanus, new subspecies. St. Lucas Solitary Vireo.

SUBSPEC. CHAR.—Smaller than *V. s. cassinii*, but with the bill (actually, as well as relatively) longer and stouter, the sides and flanks much yellower. Young in autumn without brownish beneath, and closely resembling the young of *solitarius*.

Male ad. (No. 15,504, collection of William Brewster, San José del Rancho, Lower California, July 15, 1887; M. Abbott Frazar). Top and sides of head and middle of the back dusky ashy; remainder of the upper parts, including the outer edges of the wing- and tail-feathers, dull olive green; secondaries and greater and middle wing-coverts tipped with brownish white; all the wing quills edged internally with the same; inner webs of the outer tail-feathers narrowly edged with white; under tail-coverts nearly white; bend of wing brownish white; flanks and sides

canary-yellow, slightly tinged with greenish olive on the sides of the breast and abdomen; lores dusky; a broad line from the nostril to and around the eye creamy white.

Wing,* 2.73; tail,* 2.04; bill, depth at nostril, .18; length from nostril, .33 inch.

Female ad. (No. 15,510, collection of William Brewster, San José del Rancho, Lower California, July 5, 1887; M. Abbott Frazar).—Closely similar to the male above described, but slightly smaller. Wing, 2.70; tail, 2.04; bill, depth at nostril, .18; length from nostril, .33 inch.

Young male in autumn. (No. 15,521, collection of William Brewster, Triumfo, Lower California, Dec. 23, 1887; M. Abbott Frazar).—Top and sides of head dull ashy with perhaps a tinge of olive; remainder of upper parts bright olive green, pure on the rump and upper tail-coverts, somewhat mixed with ashy on the nape and back; under parts white, the throat clear, the middle of the abdomen tinged faintly with creamy buff, the anal region, under wing- and tail-coverts pale yellow, the flanks and sides canary-yellow as in the adult but with more greenish olive on the sides of the breast and abdomen; all the wing quills except the outer primary conspicuously tipped with brownish white and edged outwardly with greenish olive, inwardly with white; greater and middle wing-coverts broadly edged with yellowish, forming two conspicuous wing-bands; the outer pair of tail-feathers narrowly bordered around the edges of both webs, as well as at the tip, with white, the other tail-feathers similarly, but still more narrowly, margined on the inner webs, the outer webs being greenish olive; bend of wing brownish white; lores dusky; a broad white line from the nostril to and around the eye as in the adult. Wing 2.70; tail, 2.15; bill, depth at nostril, .18; length from nostril, .29 inch.

This Vireo although averaging considerably smaller than *V. s. cassinii* has a bill as large and stout as in *V. s. alticola*. In the coloring of the upper parts all my spring and summer specimens agree closely with *cassinii* but there is a decided and very constant difference in the color of the flanks and sides, these having quite as much yellow as, but *much* less greenish than, *V. solitarius*. In autumnal plumage the Lower California bird approaches autumnal specimens of *solitarius* very closely, having the upper parts quite as bright olive green, the wing-bands as yellow, and the head nearly as clear ashy. There is also fully as much yellow on the sides, but much less greenish. These characteristics, with the almost total lack of brownish beneath, distinguish it readily from young *cassinii*.

* The wings and tail of this specimen are considerably worn.

Sitta carolinensis lagunæ, new subspecies. ST. LUCAS NUTHATCH.

SUBSPEC. CHAR.—Similar to *Sitta carolinensis aculeata*, but with the wings and tail shorter, the black on the tips of the outer tail-feathers more restricted.

TYPES.—*Male ad.* (No. 14,691, collection of William Brewster, Sierra de la Laguna, Lower California, May 5, 1887; M. Abbott Frazar).—Wing, 3.41; tail, 1.97; tarsus, .72; bill from nostril, .59 inch.

Female ad. (No. 14,705, collection of William Brewster, Sierra de la Laguna, Lower California, May 7, 1887; M. Abbott Frazar).—Wing, 3.20; tail, 1.73; tarsus, .67; bill from nostril, .53 inch.

The differences just mentioned, though slight, are remarkably constant in the large series of specimens before me. Specimens of *S. c. aculeata* from various localities in the Rocky Mountain region, California, and as far south along the Sierra Madre Mountains of Mexico as Chihuahua, present very little variation in size. The Lower California birds have the wings decidedly, the tail slightly, shorter than in *aculeata* but the bill is fully as long and slender. The difference in the tail marking is a curious one. The white spots on the outer three rectrices are not more extensive than in *S. c. aculeata* but they are nearer the tips of the feathers, thus narrowing the blackish apical band to from one half to three quarters the width that it is in *aculeata*. The third feather has at most only a trace of dusky on the tip, and in a few birds none whatever. Several specimens in the Lower California series have the wing-quills and all the tail-feathers, except the middle pair, light reddish brown at their tips.

NOTES ON BACHMAN'S WARBLER (*HELMINTHOPHILA BACHMANI*).

BY WILLIAM BREWSTER.

ONE of several attractive possibilities discussed by Mr. Chapman, Dr. Allen, and myself before starting on the trip described elsewhere in this number of 'The Auk'* was the meeting with

*Antea pp. 125-138.

Bachman's Warbler. If I remember rightly we did not venture to hope that more than a few of these interesting birds would be taken or seen; accordingly it was an agreeable surprise to find them actually common along the Suwanee River,* at nearly every spot where we landed, between the mouth of Santa Fe Creek and a point some fifteen miles north of the Gulf. Here the varied and luxuriant forests which line the banks of the Suwanee throughout the greater part of its course give place to monotonous and uniformly swampy woods composed chiefly of stunted cypresses intermingled with bay trees and red cedars and interspersed with saw-grass savannas. Below this point we searched vainly for our Warbler. Either it had passed northward before we arrived, or the coast country is not to its liking. The latter seemed to us the more probable theory in view of what we had learned of the bird's habits and haunts on the river above.

Our first specimen, a male, was killed by Mr. Chapman, March 12; the first female, March 15. The date of greatest apparent abundance was March 23 when I identified upwards of thirty individuals and took nine males and a female in less than three hours. The species was last seen March 24. During the period covered by these dates we traveled about seventy miles down stream (in a generally southerly direction), and rarely spent two days in the same place.

Nearly or quite all that has been hitherto written about this Warbler would lead one to infer that its favorite haunts are dense thickets, undergrowth, or low trees, and that it seldom ventures to any considerable height above the ground.† Our experience,

*There seems to be no record of the previous occurrence of the species anywhere on the *mainland* of Florida.

†Its discoverer, Dr. Bachman, according to Audubon (Birds Am., Vol. II, p. 93), described it as "a lively, active bird, gliding among the branches of thick bushes, occasionally mounting on the wing and seizing insects in the air in the manner of a Fly-catcher." The numerous specimens which Mr. Atkins has observed at Key West during migration were also "very active, and constantly in motion" and were "found alike in the trees, low bushes, and shrubbery, sometimes on or quite near the ground," seeming to "prefer the heavy and more thickly grown woods to trees or bushes more in the open" (Scott, Auk, VII, Jan. 1890, p. 17). All but two of the thirty-one specimens obtained by Mr. Galbraith on the shores of Lake Ponchartrain, Louisiana, in March, 1888, were taken "in the tops of the sweet-gum, probably attracted by insects found in the buds and blossoms of this tree." The two exceptions were "so low down on the tree on which they were discovered, that their plumage was easily distinguished" (Auk, V, July, 1888, p. 323). The last statement implies, of course, that the other birds were high above the ground, but this point is not distinctly brought out by anything in the account from which these quotations are made.

however, was directly contrary to this, for we found it oftenest on bottom lands where the forests, although composed of grand old trees thickly hung with Spanish moss, were rarely dense or tangled, the ground being nearly or quite free from undergrowth and either muddy with pools of stagnant water or carpeted with dry leaves. The bird, moreover, not only frequented the tops of the tallest trees, but at all times of the day and under every condition of weather kept at a greater average height than any other Warbler excepting *Dendroica dominica*. In its marked preference for cypresses it also resembled the species just named, but unlike it was never seen in pines. It was usually met with on or very near the banks of the river or its tributary creeks, but this may have been due to the fact that we found paddling a light canoe so much more agreeable and expeditious than walking that we seldom went far from the attractive and convenient waterways with which the region abounded.

The habit of keeping high in the trees was not, on the part of our Warbler, wholly without exceptions — which will be given later. But what species is so strictly arboreal as never to approach the ground? Under certain conditions birds often turn up in strange and unexpected places. Especially true is this of the season of migration. I remember starting a Carolina Rail and a Bittern at the same moment in a patch of beach grass on the sand-hills at Swampscott, Massachusetts, and on another occasion, in a similar place at Nantucket, I killed a Gray-cheeked Thrush, a Connecticut Warbler, and a Tennessee Warbler in the course of a few minutes; while it is not unusual, in early autumn, to find such tree-loving species as Red-bellied Nuthatches and even Brown Creepers feeding among rocks on barren points or islands along the seacoast. In view of these considerations there now seem reasons for suspecting that when, as at Key West, Bachman's Warbler has occurred numerously in thickets or low scrub, this has been due, not to a preference for such cover, but simply to the fact that no better shelter was available during a necessary halt in a long journey, and that its favorite haunts are lofty tree tops.

It would be possible, of course, to argue on the other side of the question and to suggest that the conditions which existed during our visit to the Suwanee were peculiar. Thus it may be that the tender young foliage of the great cypresses furnished an excep-

tional supply of insect or other food which at that season was scarce or wanting near the ground. In support of this assumption is the fact that Prairie Warblers, Blue-gray Gnatcatchers, and certain other species of normally low-ranging habit were often seen in the upper branches of the tallest trees where the Bachman's Warbler may have been equally out of place. But on the whole the hypothesis first suggested seems to be the better sustained, while, taken in connection with some considerations which I shall presently mention, it may partly explain why our bird has thus far eluded observation in the breeding season when, as is now evident, it must be a common bird in at least some of the Southern States.

At the time of our visit the Suwanee bottoms were alive with small birds many of which were doubtless migrants. They banded together in mixed flocks often of large size and motley composition. It was not unusual to find in close association forty or fifty Parula Warblers, half as many Yellow-rumps, and smaller numbers of Yellow-throated and Palm Warblers, Tufted and Carolina Titmice, Red-eyed and Solitary Vireos, Blue-gray Gnatcatchers, Ruby-crowned Kinglets, Carolina Wrens, Catbirds, Brown Thrushes, and Towhees, with perhaps a Prairie or Orange-crowned Warbler and often several of the smaller Woodpeckers. Such a gathering was nearly certain to contain from one or two to five or six Bachman's Warblers. These with the Parulas were most likely to be feeding in the upper branches of some gigantic cypress, at least one hundred feet above the earth, where they looked scarcely larger than humble bees and were safe from all but the heaviest charges with which our guns were supplied. Under such conditions it was next to impossible to distinguish the two species except by certain slight peculiarities of form or movement, for against the dazzling light of the southern sky they appeared as little more than silhouettes and the chestnut throat-markings of the Parula showed quite as dark and distinct as the black cravat of the Bachman's Warbler.

The latter bird, however, was the larger or rather plumper-looking of the two, and if the upper side of its wings could be seen the absence of the white bars which are so conspicuous on the wings of the Parula Warbler was quickly noticed. But these differences were not easily made out when the birds were in tree tops, and as we refrained from chance shots most of our specimens

were obtained at the expense of much patient 'star gazing' accompanied by inevitable straining of the neck muscles; while far too often, despite our utmost care, the victim finally selected would prove to be an unfortunate Parula.

Of course it is only the male Bachman's Warbler which can be confounded with the Parula, for the female — setting aside occasional individuals which have black on the throat — is most like he Orange-crowned Warbler. Indeed it resembles the latter species so very closely, not only in general coloring but in form and movement also, that it would require a remarkably keen and practised eye to distinguish one from the other at a greater distance than a few paces. Both sexes of Bachman's Warbler habitually carry the feathers of the crown a little raised, giving the head a fluffy appearance.

A few shots fired into a flock such as that just described would usually alarm and scatter its members or start them in rapid motion through the woods, but one of our party made the curious and very useful discovery that they could be quieted and brought together again by an imitation of the whistle of the Tufted Titmouse. Apparently this bird was recognized as a guide or leader of the throng, a fact possibly due to its loud and persistent voice.

At times, especially on frosty mornings, or when there was a cold north wind, most of the small birds (including the Parulas) inhabiting this region, descended from the tree tops into low bushes, especially those growing out over the water on the sunny side of the river; but with a single exception — that of the bird shot by Mr. Chapman, March 12 — no Bachman's Warblers were ever seen in such situations. On these, as well as certain other occasions, however, they frequented to some extent small maples, magnolias, or hackberry trees on the river banks and on dry ridges in the swamps, coming down occasionally to within twenty or thirty feet of the ground but almost never lower. Once I found two males together, but not in company with any other birds, in oak scrub, on the crest of a sandy bluff. They kept as high as the trees permitted and appeared restless and ill at ease, as if the place were not to their liking, which was doubtless the case. Most of the specimens collected on the 23rd were taken on rather high ground bordering the river, in a tract of open woods where the trees were chiefly deciduous oaks the leaves of which, just beginning to unfold, had that delicate salmon-pink tint seen in our northern oaks at the corresponding season. Within an area

of ten or fifteen acres there must have been nearly one thousand Warblers, of which probably five per cent were Bachman's. It was comparatively easy to identify them, for the trees although large and spreading were not excessively high, and with more time I could have taken thrice as many specimens as were actually obtained.

On the morning just mentioned I heard several males singing, and shot one in the act, after watching him awhile. He was perched on a dead twig in the very top of a tall sweet gum, with his breast turned toward the sun. At each repetition of the song he threw up his head and I could see the throat swell and the wings quiver under the strong effort, but during the whole time that I was looking at him there was no other movement, save an occasional turning of the head. The song is unlike that of any other species of *Helminthophila* with which I am acquainted and most resembles the song of the Parula Warbler. It is of the same length and of nearly the same quality or tone, but less guttural and without the upward run at the end, all of its six or eight notes being given in the same key and with equal emphasis. Despite these differences it would be possible to mistake the performance, especially at a distance, for that of a Parula singing listlessly. The voice, although neither loud nor musical, is penetrating and seems to carry as far as most Warblers'. Besides the song the only note which we certainly identified was a low hissing *zee-e-eep*, very like that of the Black-and-white Creeper.

Both Dr. Bachman and Mr. Atkins have characterized Bachman's Warbler as an active, animated bird, and the former saw it "mounting on wing and seizing insects in the air in the manner of a Flycatcher." * This again is curiously at variance with our experience which I find described in my notes in the following words, written at the close of the trip and fully approved by Mr. Chapman when the subject was fresh in our minds:

"The habits and movements of Bachman's Warbler are in some respects peculiar and characteristic. It does not flit from twig to twig nor launch out after flying insects in the manner of most Warblers, and many of its motions are quite as deliberate as those of a Vireo. Alighting near the end of a branch it creeps or sidles outward along a twig, and bending forward until the head points nearly straight down, inserts the bill among the ter-

*See foot-note on page 150.

minal leaflets with a peculiar, slow, listless motion, keeping it there a second or two, and repeating the leisurely thrust many times in succession without changing its foothold. The action is like that of several other members of the genus — notably *H. pinus* and *H. chrysoptera* — under similar conditions, and suggests the sucking in of liquid food, perhaps honey or dew. Not infrequently a bird would hang back downwards beneath a twig and feed from the under sides of the leaves in the manner of a Titmouse. The Parula Warblers did the same thing — and many fell to our guns in consequence."

When in maple, hackberry, or magnolia trees the male Bachman's Warbler was not difficult to recognize, especially if it showed its throat and breast against a background of solid foliage, for then the black cravat and rich, uniform yellow of the under parts were conspicuous and unmistakeable. In such a position it might have been mistaken for a Black-throated Green Warbler, but this species, fortunately for us, was not among the birds found on the Suwanee River.

Many of the hackberry trees along the banks of this stream contained compact bunches — nearly as large as a child's head — of dead leaves blackened by exposure to wind and weather. These bunches probably sheltered insects or their larvæ, for they attracted several species of birds, especially the Bachman's Warblers which would work at them* minutes at a time with loud rustling, sometimes burrowing in nearly out of sight and sending the loosened leaves floating down to the ground. Upon exhausting the supply of food or becoming tired of the spot — whether one of the leaf bunches or the extremity of a cypress branch — the bird almost invariably started on a long flight, often going hundreds of yards through the woods or crossing the river, instead of merely passing to the next branch or tree as almost any other Warbler would have done under similar circumstances. This habit seemed to us characteristic of the species.

The sexual organs of all the specimens examined, especially those of the females, were only slightly developed, which may account for the fact that the males sang so seldom. Probably none of the birds which we killed would have bred for three or four weeks. Hence there is no proof that they were not all migrants bound to some point further north, and simply following

*Mr. Atkins has also observed this at Key West. See Auk, VII, Jan. 1890, p. 17.

the course of the Suwanee as a convenient pathway. Nevertheless, I cannot help suspecting that they breed numerously in this river-bottom, and that the nest is placed in the Spanish moss (*Tillandsia*). On several occasions I saw females clinging to streamers of this moss, peeping into it as if looking for a nesting-place, although of course they may have been merely searching for food. A few of our specimens had the skin thickly lined with fat, but the majority were in only fair condition.

Our males, thirty-six in number, vary exceedingly in respect to the depth and extent of the black of the head and throat. This in the finest birds is essentially pure with a slight lustre, but most of the black feathers are narrowly tipped with ashy or olive yellow which doubtless disappears later in the season. In the duller birds this light edging is broad and diffused, obscuring or half concealing the black, and giving the plumage a mottled appearance. Owing partly to this, but chiefly — as is shown by examination of the under plumage — to variation in the extent of its actual distribution, the black in some cases appears over the entire throat and jugulum; in others is restricted to a small central space on the latter, leaving the whole throat, as well as the chin, yellow. Various styles intermediate between these extremes are shown by our series of which scarcely any two specimens are precisely alike. In some the anterior border of the black is abruptly and sharply defined, in others the throat constitutes a neutral area which is spotted or mottled with black on a yellow ground. One bird has the spots confined to the centre of the throat where they form a cluster separated from the black of the jugulum by an interval of nearly pure yellow, in another the middle of the throat is immaculate and the spots extend forward along its sides. The posterior border of the black varies similarly in distinctness, but its position is nearly always at about the dividing line between the jugulum and the breast. Its outline is sometimes deeply concave, sometimes decidedly convex or rounded, and occasionally nearly straight. The black on the head varies from a solid, glossy patch embracing the entire crown — but never the occiput, as represented in Audubon's plate — to a narrow, dusky band bordering the forehead. Even this band is wanting in occasional birds which have the dark color represented only by inconspicuous and half-concealed black or dusky spots on the centres of the feathers of the crown.

The yellow of the underparts is also very variable. In some

birds it is pale or obscured with dusky olive, in others rich and pure ranging from deep lemon to light gamboge, which, however, in the brightest specimen before me does not quite equal the coloring represented in Audubon's much criticized plate. The yellow sometimes spreads over the entire abdomen and also tinges the sides, flanks, and crissum, but in the dullest birds it is confined to the breast and a narrow central space on the fore abdomen, the remainder of that part, with the crissum and flanks, being ashy white more or less suffused with smoke-gray. There is apparently no correlation between the extent of the black on the jugulum and throat and that on the crown, nor between the amount or purity of black on either or both of these parts and the depth of the yellow. Thus the bird with the largest crown patch has most of the throat yellow, and the one in which the cravat is best developed has an exceptionally small amount of black on the crown, while neither is among the specimens which are most richly colored in respect to the yellow of the under parts. The yellow frontal band is fairly uniform in color, but is twice as wide in some birds as in others.

We collected ten females. Of these the brightest is practically indistinguishable from the dullest male when the two are placed side by side on their backs, for in the general coloring of their underparts they agree very closely, much better in fact than does the male with any of the other examples of its own sex. This female, however, has a trifle less black on the jugulum and only a little concealed black spotting on the crown, but another which shows only a very little black on the jugulum possesses a band of exposed dusky spots on the crown. The most constant and evident sexual character seems to be the presence of a clearly outlined yellow frontal band in the male and its absence in the female. In all the males which I have examined this band is conspicuous and well defined. Many females, it is true, have the forehead tinged with yellowish or olive, but this is merely a suffusion, not a pure color, and in its extension backward it invariably shades insensibly into the color of the crown instead of being separated from the latter by a distinct line of demarcation. It should be stated, however, that I have been able to apply this test only to spring specimens and that it may fail with the young in autumn plumage.*

*Audubon states that the female is "considerably smaller than the male," but our specimens show that there is only a slight *average* difference in this respect. The largest females are decidedly larger than the smallest males.

A LIST OF BIRDS OBSERVED AT SANTAREM, BRAZIL.

BY CLARENCE B. RIKER.

With Annotations by Frank M. Chapman.

[*Concluded from p. 31.*]

149. **Momotus nattereri** *Scl.*—Common; seen only in the lowlands.

[Three examples agree with a Bolivian specimen. This species has apparently not before been recorded from the Lower Amazon.—F. M. C.]

150. **Ceryle torquata** (*Linn.*).—Common.

151. **Ceryle amazona** (*Lath.*).—Common.

152. **Ceryle americana** (*Gm.*).—Common.

[153. **Ceryle superciliosa** (*Linn.*). — A female taken by Smith. — F. M. C.]

154. **Trogon melanurus** *Sw.*—A female taken June 23 and a male July 8, 1889, near the river.

[The male has the throat, breast, and upper surface of a rich peacock-blue, deepest on the rump, and with comparatively slight trace of bronzy reflections.—F. M. C.]

155. **Trogon viridis** (*Linn.*).—Common; more abundant in the lowlands.

[156. **Trogon meridionalis** *Sw.*—"Santarem, May 22; deep woods, rare."*]

157. **Galbula rufoviridis** *Cab.*—Very common along streams, sitting, Kingfisher-like, on projecting branches.

[158. **Galbula viridis** *Lath.*—"Santarem, April 10; common near streams."*]

159. **Galbula cyanicollis** *Cass.*—A male taken June 16, 1887, was the only one seen.

160. **Bucco tectus** (*Bodd.*).—A male taken July 1, 1887.

161. **Bucco tamatia** (*Gm.*).—A male and female taken July 11, 1887, in the forests of the lowlands.

[Indistinguishable from a Guianan specimen.—F. M. C.]

162. **Bucco maculatus** (*Gm.*).—A male and female taken July 14, 1884, on the campos.

[These examples agree with Bahia specimens. Apparently the species has not before been recorded from the Amazon.—F. M. C.]

163. **Malacoptila rufa** (*Spix*).—A male taken June 13, 1887, in a dense forest twenty miles from the river.

164. **Monasa morpheus** (*Hahn*).—Common in dense forests on the 'mountain'.

*Allen, Bull. Essex Inst., Vol. VIII, No. 8, 1876, p. 80.

165. **Monasa nigrifrons** (*Spix*).—A male taken June 22, 1887, near the river.

166. **Chelidoptera tenebrosa** (*Pall.*).—Common; congregating on dead trees.

[167. **Crotophaga ani** *Linn.*—Two specimens collected by Smith.—F. M. C.]

168. **Crotophaga major** *Linn.*—One specimen.

169. **Piaya cayana pallescens** (*Cab.*).—Common.

170. **Piaya minuta** (*Vieill.*).—A male, taken June 22, 1887, was the only one seen.

[171. **Coccyzus euleri** *Cab.*

Coccyzus lindeni ALLEN, Bull. Essex Inst., VIII, 1876, p. 78.

"Santarem, April 19, 1873" (l. c.).

Through the kindness of Mr. William Brewster, Assistant in Ornithology at the Museum of Comparative Zoölogy, I have been enabled to examine the type of *C. lindeni*. It agrees perfectly with a *Coccyzus* from Matto Grosso in the American Museum collection, which, being from the same general region as Cabanis's type, is very probably similar to the bird he described as *euleri*.—F. M. C.]

172. **Rhamphastos erythrorhynchus** (*Gm.*).—Common in the depths of the palm swamps.

173. **Rhamphastos ariel** *Vig.*—Very common everywhere.

[174. **Pteroglossus aracari** (*Linn.*).—"Santarem; common in the forests." *]

175. **Pteroglossus wiedi** *Sturm.*—Common.

176. **Pteroglossus inscriptus** *Wagl.*—Not common; two specimens taken on the 'mountain' in 1884; none seen in 1887.

177. **Pteroglossus bitorquatus** *Vig.*—Four specimens taken in 1884, none seen in 1887.

[178. **Selenidera gouldi** (*Matt.*).

?Selenidera maculirostris ALLEN, Bull. Essex Inst., VIII, 1876, p. 81.

A second lot of birds, received from Santarem through Mr. Southwick since the first part of this paper was published, contains, among others not in the collections previously mentioned, one example of this Toucan taken December 6, 1889.—F. M. C.]

179. **Ara hyacinthina** (*Lath.*).—Very rare; found only about the inland ponds in the dense forests of the interior where it feeds upon the fruit of a palm peculiar to these localities. I obtained three specimens wenty-five miles back from Santarem on June 10, 1887.

180. **Ara chloroptera** *Gray.*—Common.

[181. **Ara ararauna** (*Linn.*).—"Santarem." *]

[182. **Ara maracana** (*Vieill.*).—Three specimens taken in December, 1889, and January, 1890, are included in the second lot of Santarem birds received from Mr. Southwick.—F. M. C.]

183. **Conurus pavua** (*Bodd.*).—Five specimens taken in June, 1887.

* Allen, Bull. Essex Inst., Vol. VIII, No. 8, 1876, p. 81.

184. Conurus aureus *Gm.*—A female taken July 19, 1884.

[185. Conurus roseifrons *Gray.*—Santarem, May 28; in small flocks.*]

186. Conurus cyanopterus (*Bodd.*).—Common in 1884, but none seen in 1887.

187. Brotogerys virescens (*Gm.*).—A male and female taken in July, 1884, on the campos back of Santarem.

188. Brotogerys tui (*Gm.*).—One specimen.

[189. Brotogerys tuipara (*Gm.*).—Two specimens collected by Smith in April, 1887.—F. M. C.]

190. Amazona festiva (*Linn.*).—A specimen taken in July, 1887.

[191. Amazona ochrocephala (*Gm.*).—Three specimens taken in January, 1890, received through Mr. Southwick.—F. M. C.]

192. Pionus menstruus (*Linn.*).—A male and female taken in July, 1884, in a dense forest on the 'mountain'.

193. Pionus violaceus (*Bodd.*).—A female taken August 5, 1884, in a dense forest on the 'mountain.'

[194. Pionopsitta brachyura (*Temm.*).—A male taken by Williams September 14, 1883.—F. M. C.]

195. Psittacula deliciosa *Ridgw.*

Psittacula deliciosa RIDGW., Proc. U. S. Nat Mus., X, 1887, p. 545; Auk, V, 1888, p. 461.

Three males and four females taken in June and July, 1887.

[Dr. Hartlaub, to whom I have sent specimens of this bird for comparison with his *P. cyanochlora*, writes me as follows concerning the relationships of the two species: "The *Psittacula* you have sent me is *not Ps. cyanochlora* Natt. (type specimen in our collection). The principal difference is this: in your bird the color of the tergum and uropygium has a strong bluish shade. In our *cyanochlora* (*old*) the color of these parts is most brilliant emerald green without the slightest bluish hue. A second difference is this: in your bird the blue on the wing occupies a much larger space, and for this reason is much more conspicuous and brilliant. In the beautifully stuffed specimen of our *Ps. cyanochlora* the blue on the wing is nearly invisible. The green color of the upper parts in our bird is a little more shaded with olivaceous than in yours . . . . There is no difference in the extent of the blue under the wing."—F. M. C.]

196. Lophostrix cristata (*Daud.*).—A female taken June 3, 1887, on the 'mountain.'

197. Pulsatrix torquata (*Daud.*).—A female taken July 8, 1887, in the lowlands.

198. Rupornis magnirostris nattereri (*Scl.*).—A female taken June 6, 1887, in the lowlands.

[Four specimens from Santarem prove on comparison with twenty odd examples of true *nattereri* from Matto Grosso to be clearly intermediate between that form and the northern *magnirostris*. In the grayish color of upper breast and throat they approach *magnirostris*, in the extent and

* Allen, Bull. Essex Inst., Vol. VIII, No. 8, 1876, p. 81.

intensity of the rufous bars they are nearer *natterери*, and I think they may be better referred to that subspecies.—F. M. C.]

[199. **Asturina nitida** (*Lath.*).—"Santarem, July 12; in deep woods."*]

200. **Busarellus nigricollis** (*Lath.*).—Common about the river, nesting in tall trees along the banks.

201. **Heterospizias meridionalis** (*Lath.*).—A female taken July 28, 1884, in the lowlands.

202. **Urubitinga urubitinga** (*Gm.*).—Common about meadows.

203. **Spizaëtus manduyti** (*Daud.*).—A specimen taken June 14, 1887, in the forest.

204. **Accipiter bicolor** (*Vieill.*).—An immature female taken June 21, 1887, in the lowlands.

205. **Geranospiza cærulescens** (*Vieill.*).—One specimen taken June 27, 1887, near the river.

206. **Falco rufigularis** *Daud.*—A specimen taken July 28, 1884, in the lowlands.

[207. **Falco deiroleucus** *Temm.*—One specimen taken by Smith.—F. M. C.]

208. **Gampsonyx swainsoni** *Vig.*—Common in the lowlands.

[209. **Rostrhamus sociabilis** (*Vieill.*).—An immature male taken by Williams July 25, 1883.—F. M. C.]

210. **Leptodon cayennensis** (*Gm.*).—An adult taken June 28, 1887 near the river.

211. **Harpagus diodon** (*Temm.*).—A male taken July 27, 1884; the stomach contained grass and insect remains.

212. **Milvago chimachima** (*Vieill.*).—An immature specimen taken June 27, 1887, in the lowlands.

213. **Polyborus cheriway** (*Jacq.*).—An adult taken near the river June 19, 1887.

[The specimen differs from Texan examples in having less white on the hind neck, interscapulars, and breast, and shows therefore not the slightest approach to *P. tharus*. So far as I am aware there is no previous record of this species south of the Amazon.—F. M. C.]

214. **Cathartes aura** (*Linn.*).—Very common.

215. **Gyparchus papa** (*Linn.*).—One specimen taken June 14, 1887, twenty miles from the river.

216. **Ardea egretta** (*Gm.*).—Very common.

217. **Ardea candidissima** (*Gm.*).—Common.

218. **Ardea cyanurus** (*Vieill.*).—An adult female taken June 17, 1887.

219. **Tigrisoma brasiliense** (*Linn.*).—One specimen.

[220. **Zebrilus pumilus** (*Bodd.*).—The second shipment received from Mr. Southwick contained one specimen of this rare Bittern, taken at Santarem, February 4, 1890.—F. M. C.]

221. **Dendrocygna discolor** *Scl. & Salv.*—Very common in flocks.

222. **Cairina moschata** (*Linn.*).—Common.

223. **Columba speciosa** *Gm.* Found only in flooded palm forests of the densest character.

* Allen, Bull. Essex Inst., Vol. VIII, No. 8, 1876, p. 82.

Columba rufina (*Temm.*).—Common in the forests of the lowlands, feeding in large flocks amongst the fruit trees.

[224. Columba locutrix *Wied.*

Columba locutrix WIED, Reise Bras., II, 1821, p. 118; — ALLEN, Bull. A. M. N. H., II, 1889, p. 290.

A single specimen of this Dove, collected by Smith March 3, 1889, is with little doubt specifically identical with the type of Wied's *Columba locutrix* (A. M. N. H., No. 6442), and differs from it only in intensity of coloration. The upper surface is darker throughout, the outer margins of the primaries lack the slight grayish edging observable in Wied's specimen, and the lower parts of the Santarem birds are of a more glaucous-vinaceous hue. These differences may be subspecific, they may be seasonal, or they may be in part accounted for by the somewhat faded condition of Wied's type, which long exposure to light has evidently caused.— F. M. C.]

225. Zenaida jessicæ *Riker.*

Zenaida jessicæ RIKER MS., RIDGW., Proc. U. S. Nat. Mus., X, 1887, p. 527. The type was taken June 1, 1887, and two other specimens were taken from a flock feeding on the ground about a plantation.

226. Columbigallina passerina (*Linn.*).—Common about campos and clearings, in flocks of a dozen or more.

[South American specimens are certainly separable from the North American birds to which Linnæus's description of "*rostro pedibusque flavis*" evidently belongs. Lack of proper material, however, will not permit me to attempt to define the range and relationships of the two or more forms generally classed under the name *passerina*.—F. M. C.]

227. Columbigallina talpacoti (*Temm.*).—Not common.

228. Engyptila erythorothrax (*Temm.*).—Common on the campos; found nesting in July.

[229. Engyptila rufaxilla (*Rich. & Bern.*).—"Santarem, June 6; seen singly and apparently not common."*]

230. Geotrygon montana (*Linn.*).—Two specimens taken on the 'mountain' in 1887.

[231. Pipilo cumanensis (*Jacq.*).—"Santarem, May 10; deep woods, not common."*]

232. Pipile cujubi (*Pelz.*).—Common on the 'mountain' about clearings, usually in pairs or flocks; one specimen was taken July 26, 1884. The native name is *Cujubi.*

[233. Ortalida motmot (*Linn.*).—A specimen taken by Smith March 1, 1889, and a second received through Mr. Southwick collected January 14, 1890.—F. M. C.]

[234. Odontophorus guianensis (*Gm.*).—A specimen collected by Smith.—F. M. C.]

235. Opisthocomus cristatus (*Lath.*).—Very common along the river's banks.

*Allen, Bull. Essex Inst., Vol. VIII, No. 8, 1876, p. 82.

236. **Aramides cayennensis** (*Gm.*).—Common along the river; often trapped by the natives.

237. **Porzana cayennensis** (*Gm.*).—Common in the marshes.

[238. **Heliornis fulica** (*Bodd.*).—One specimen taken by Williams.—F. M. C.]

239. **Jacana jacana** (*Linn.*).—Very common.

240. **Vanellus cayenennsis** (*Gm.*).—A male and female taken June 22, 1887.

241. **Ægialitis collaris** (*Müll.*).—A male taken June 24, 1887.

[242. **Himantopus mexicanus** (*Müll.*).—An adult collected by Smith April 16, 1889.—F. M. C.]

[243. **Gallinago frenata** (*Licht.*).—Four specimens collected by Smith in March and April, 1889.—F. M. C.]

[244. **Actitis macularia** (*Linn.*).

Tringoides macularis ALLEN, Bull. Essex Inst., VIII, 8, 1876, p. 83.

"Santarem, April 12; common along the river banks. Specimens were obtained both in mature and immature plumage." (Allen, *l. c.*).]

[245. **Phæthusa magnirostris** (*Licht.*).—A specimen collected by Smith March 3, 1889.—F. M. C.]

[246. **Tinamus guttatus** *Pelz.*—A specimen collected by Smith February 4, 1889, I refer provisionally to this species. It differs from an Upper Amazonian example identified by Mr. Salvin as "*T. guttatus*, but with fewer black marks on the lower back," in being less rufous and more olivaceous above, in having all the feathers of the back, rump, wing and tail-coverts banded subterminally with black and spotted with pale rufous, these spots growing more numerous posteriorly. In the coloration of the lower parts, and in size the two specimens agree.—F. M. C.]

247. **Tinamus tao** (*Temm.*).—One specimen taken August 5, 1884, in a dense forest on the 'mountain.'

248. **Crypturus pileatus** (*Bodd.*).—Common in the lowlands; its strange note heard only about sunset.

[249. **Crypturus cinereus** (*Gm.*).—"Santarem, July 6; common in deed woods."*]

250. **Crypturus parvirostris** *Wagl.*—Common amongst clumps of bushes on the campos; acting very much like a Quail, and as difficult to shoot.

[A female taken June 14, 1884, the only specimen received, I refer with some hesitation to this species of which I have no examples for comparison. In coloration it apparently agrees with descriptions of *parvirostris*, but there is a great discrepancy in the measurements given by Taczanowski (Orn. Peru, III, p. 299) for this species and the measurements of the present specimen, as the following figures show:

C. parvirostris, ♀, (*ex Tacz.*), wing 118 mm.; bill 23 mm.; tarsus 25 mm.

Santarem specimen, wing 103 mm.; bill 16 mm.; tarsus 25 mm.

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*Allen, Bull. Essex Inst., Vol. VIII, No. 8, 1876, p. 83.

It is very probable this bird may prove to be an as yet undescribed form of *parvirostris* from the Lower Amazon.—F. M. C.]

[251. Crypturus *sp. nov.?*—A specimen of *Crypturus* collected by Smith March 29, 1889, I am unable to identify with any described species. I hesitate, however to add to the confusion which exists in this group by naming a species which lack of material for comparison would not permit me properly to characterize. For the present, therefore, I simply give the following brief description:

Crown, hind neck, and upper back vinaceous-brown; lower back, rump, upper tail-coverts, tail, greater and lesser wing-coverts, black or brownish black barred with buffy; wings brownish black, the secondaries with buffy spots on their outer webs; throat ochraceous-buff; neck and breast cinereous with a slight brownish wash; flanks blackish, barred with buffy; centre of the abdomen white; under tail-coverts light rufous with black vermiculations. Wing, 6.50; tarsus, 1.80; culmen, 1.20 inches.—F. M. C.]

SUMMER BIRDS OF THE BRAS D'OR REGION OF CAPE BRETON ISLAND, NOVA SCOTIA.

BY FRANCIS H. ALLEN.

IN 'THE AUK' for January, 1887, (Vol. IV, p. 13) appeared an article with the above title by Mr. Jonathan Dwight, Jr. Mr. Dwight's observations were conducted from Aug. 4 to Aug. 16, principally in the immediate vicinity of Baddeck. I may be permitted to make some additions to his list based on my own observations from June 4 to June 12, 1890. My time was much too short and too much occupied with other things to make as careful an investigation as should have been made. Therefore, in spite of the fact that my visit was at a much more favorable time of year than Mr. Dwight's, my list numbers only fifty-five species. His list numbers fifty-nine, but four of them, *Tringa minutilla*, *Ereunetes pusillus*, *Totanus flavipes*, and *Arenaria interpres*, I think it is safe to say were migrants. Another species, *Rallus virginianus*, is marked by an interrogation point, indicating some uncertainty as to its occurrence. Of the fifty-four remaining species, *seventeen* are not on my list, and, what is still more surprising, *eighteen* which I observed are not

on Mr. Dwight's. With the possible exception of *Glaucionetta clangula americana*, all the species which I noted were doubtless summer residents. A combination of the two lists makes a total of seventy-one summer residents.

My additions to the list are as follows.

Urinator imber.—One seen on Bras d'Or Lake.
Glaucionetta clangula americana.—Quite common.
Ægialitis semipalmata.—One taken.
Pandion haliaëtus carolinensis.—A few observed.
Picoides arcticus.—One observed.
Contopus borealis.—Quite common.
Empidonax minimus.—Not uncommon.
Perisoreus canadensis.—A few observed.
Spinus pinus.—A few observed.
Vireo solitarius.—Not common.
Helminthophila ruficapilla.—Not common.
Dendroica castanea.—One seen June 4.
D. striata.—Not common.
D. palmarum hypochrysea.—A few observed.
Seiurus aurocapillus.—A few observed.
S. noveboracensis.—One or two observed.
Regulus calendula.—Common.
Turdus ustulatus swainsonii.—Quite common.

The following are the birds on Mr. Dwight's list (besides the five previously mentioned) which did not come under my notice.

Larus philadelphia.
Ardea herodias.—I saw one at Northeast Margaree, 28 miles northwest of Baddeck.
Gallinago delicata.
Dendragapus canadensis.
Bonasa umbellus togata.
Haliæëtus leucocephalus.—An Eagle, too far off for identification, was seen chased by a Crow, June 11, near the Big Baddeck River.
Falco sparverius.
Coccyzus sp.?
Sphyrapicus varius.
Spizella socialis.
Melospiza georgiana.
Habia ludoviciana.
Ampelis cedrorum.
Vireo olivaceus.
Sylvania pusilla.
Parus atricapillus.
Regulus satrapa.

Attention should be called to Mr. Dwight's note in 'The Auk' for April, 1889, (Vol. VI, p. 186) in which he says that the Terns obtained by him proved to be *S. hirundo* instead of *paradisæa* as in his list and remarks.

I may add that I met with a single *Botaurus lentiginosus* at Northeast Margaree, where I spent one rainy morning.

During my stay at Baddeck I was particularly struck with the abundance of Terns, Spotted Sandpipers, Kingfishers, Eave Swallows, Yellow, Myrtle, and Magnolia Warblers, and Ruby-crowned Kinglets, and with the absence of Red-eyed Vireos, Wood Pewees, Yellow-bellied Woodpeckers, and Cedarbirds.

Of the general character of the country and the woods Mr. Dwight has written faithfully and interestingly. The season this year was a very late one in Cape Breton. At the time of my departure, the trees had not all leafed out, the grass was still brown on the hills, and the few apple-trees which there were had not begun to blossom. The ground was in some places yellow with dandelions. I found a very few belated blossoms of the mayflower, *Epigæa repens*. Rhodora was in full bloom, but Labrador tea had not yet opened. It was quite cold most of the time, but I cannot say how cold, as I saw no thermometer. I was told that snow fell on the Baddeck Mountains on the night of June 9.

On June 5 I visited a small island in the Bras d'Or Lake, over which a great many Terns were flying, but though I came across three or four hollows scratched in the sand, no eggs were found, and it was probably too early for them. On June 9 I found three Spotted Sandpipers' nests, each containing four eggs, on the 4th a Snowbird's containing young, and on the 11th another Snowbird's with one young one and two eggs. On the 9th a young Robin, just able to fly a little, was seen by the side of the road.

A FURTHER REVIEW OF THE AVIAN FAUNA OF CHESTER COUNTY, SOUTH CAROLINA.

BY LEVERETT M. LOOMIS.

(*Continued from p. 59.*)

186. **Scolecophagus cyanocephalus.** Brewer's Blackbird. — As has already been reported (Auk, Vol. IV, Jan., 1887, p. 76), three males and two females were captured Dec. 9 and 10, 1886. These birds were a part of a little troop of over a dozen that were then occupying a field in the outskirts of the town of Chester. The weather at the time was exceedingly rigorous — the opposite of that prevalent the past seasons. None have been observed since.

187. **Quiscalus quiscula æneus.** Bronzed Grackle — At the outset of my ornithological study it so happened that the Crow Blackbirds taken were typical *quiscula*. As this was the form ascribed to the region by the books, a thorough investigation was not then deemed necessary. Subsequently the continued recurrence of birds essentially Western induced further inquiry, and the outcome was the discovery of *æneus* in November, 1887 (Auk, Vol. V, Jan., 1888, p. 113). Since then, whenever the opportunity has offered, the matter has been diligently followed up, and the result, though perhaps fortuitous, indicates a superiority of numbers for *æneus*. While Crow Blackbirds appear in the migrating seasons in vast droves, conveying an impression of extreme abundance, their dispersion is not general. A migration may be worked through without many being actually met with, although multitudes may be reported from adjoining neighborhoods. As at present advised, the Bronzed Grackles arrive about November 1, and during this month their southward migration is at its height. In the depth of winter occasional flocks are seen. Usually they are of small extent. In February the movement northward is in full progress, and it continues on through March. I have no knowledge of their breeding here.

149. **Calcarius pictus.** Smith's Longspur.—Since the one was killed with a stone in December, 1880, a second specimen has been secured. This bird—an adult female—was shot Feb. 9, 1889. I have several times thought I have seen stray individuals passing overhead, but my acquaintance with this species is too limited to speak with certainty.

64. **Ammodramus savannarum passerinus.** Grasshopper Sparrow.— While later observations show that this Sparrow occurs in every month of the year, yet it is not truly a 'permanent resident'. The birds of December and January are rare stragglers that have tarried behind after mild autumns, or have been tempted from the south, presumably from the lower part of the State, by the clemency of the weather. Ordinarily they appear in force about the beginning of the second week of April, although

adventurous scouts sometimes arrive as early as February. From the first coming of the bulk in April, onward into September, they are very common; afterwards there is a diminution in their forces, and toward the close of October only stragglers are to be found, which sometimes linger on into November. My dates for the first two winter months are Dec. 5, 14, 1885; Jan. 22, 1887; Dec. 25, 1889; Jan. 2, 1890. The song period lasts without interruption for about five months.

151. **Ammodramus leconteii.** Leconte's Sparrow. — The statement in my second list, that Leconte's Sparrows were common "winter residents," was fully borne out from the time of their discovery in November, 1881, to the close of the season of 1884-85. Since then they have been almost wholly absent. In the two winters immediately following not a single example rewarded my search. Individuals were captured March 2 and 3, 1888; Dec. 25, 1888; Dec. 19, 1889. Except one other, seen Dec. 25, 1889, these were all that fell under my observation during this interval. Explanation of their absence is to be sought, I think, not in their failure to journey southward, but in the transposition of the local centre of abundance to some other quarter not far remote. The weather can hardly be said to have exerted a governing influence over their movements, for the meteorological conditions in these years have varied greatly, and seasons have been not unlike those during the periods of greatest abundance. The presence of the two in March, 1888, is significant. The distribution of these Sparrows, hereabouts, appears to be very restricted. I have thus far discovered them only in a narrow stretch of country, about three miles in length, lying east of the town. The earliest record I have is Nov. 11, 1881, and the latest March 30, 1885. The average duration of their stay, so far as ascertained, in the years of abundance was above four months.

188. **Peucæa æstivalis bachmanii.** Bachman's Sparrow. —It is only of recent years that I have become aware of the existence of this species in this locality. As so much time has been devoted of late to other fields during summer, I am not able to throw much light upon its abundance or upon the times of its arrival and departure. It appears, however, to be a regular visitant, coming soon in the spring and spending the breeding season. March 21, 1888, is the earliest date of its appearance I have memorandum of.

153. **Habia ludoviciana.** Rose-breasted Grosbeak. — In fall Rose-breasted Grosbeaks are apparently of but casual occurrence. In spring they visit us regularly, the first males arriving shortly after the 15th of April. Loiterers tarry behind until about the middle of May. In some years they are decidedly common. They are found singly and in small companies. My previous assertion as to their partiality for high ground does not hold good. If latest experiences were taken as a criterion, the contrary rather would be found to be true. On their northward journey they are inclined to be musical.

152. **Spiza americana.** Dickcissel.—I entered this Finch as a "summer resident" in the second list on the strength of its having been ob-

served commonly in certain restricted situations near the town in 1883 and 1884. I supposed then that previously it had been overlooked, but I am now constrained to believe that its appearance was sporadic, as it has not been seen since in the six years that have elapsed. It is remarkable that it should come so abruptly, be common for two seasons, and then utterly abandon the locality.

56. **Vireo solitarius.** Blue-headed Vireo.—The Blue-headed Vireo is a regular, but not common migrant. In spring it occurs in April (4 to 21). In fall, it returns about the middle of October — 15th the earliest date — and abides until November. Laggards sometimes linger on into this latter month. These Vireos sing finely in April, and occasionally, though imperfectly, in autumn. While uttered with equal force and unction, the musical efforts of the vernal performers (intermediates) seem to lack the penetrating power peculiar to *alticola* as heard in its mountain home. Still they may not attain their complete song when migrating.

All the spring specimens that have been taken are intermediate between *solitarius* and *alticola* (their upper parts beyond the rump being strongly washed with plumbeous), while the majority of the autumnal ones are typical *solitarius*. Taking the Pickens examples (Auk, Vol. VII, p. 126) as a basis of comparison, I am impelled to rank these intergrades with *solitarius*. The uniform deep black of the bill in adult *alticola* seems to be a more potent character in the discrimination of the two forms than the variable plumbeous veiling of the upper portions, which, however, in extreme *alticola* is always diagnostic. In Chester specimens—both in spring and fall—the lower mandible invariably displays plumbeous. In some the plumbeous predominates, the tip only being black. The black of the whole bill is of a slaty cast, not an intense black as in the mountain race. Mr. Ridgway has informed me that the examples of *solitarius* which have passed under his notice have invariably had the basal half, at least, of the lower mandible plumbeous.

189. **Helinaia swainsonii.** Swainson's Warbler.—A male was taken Aug. 30, 1887, in the neighborhood of the town (Auk, IV, 347). Whether this individual was simply an estray from the seaboard or a transient from an inland habitat can only be surmised. It is worthy of note that a terrific storm prevailed ten days before along the coast of North Carolina, and that the largest flock of Ricebirds — chiefly coastwise migrants in South Carolina at this season—ever witnessed here in the southward migration was met with Aug. 22—two days after the storm.

26. **Helmitherus vermivorus.** Worm-eating Warbler. — This Warbler has been noted from July 25 to October 6, and from April 19 to May 12. So far as known, it does not breed. It appears to be more numerous in some years than in others. Viewed in the most favorable aspect, it does not reach higher rank in the scale of abundance than tolerably common During its transits it is seen at intervals rather than continuously.

190. **Helminthophila pinus.** Blue-winged Warbler.—A male was obtained April 30, 1887. This is the only instance of its capture in this vicinity.

191. **Helminthophila chrysoptera.** GOLDEN-WINGED WARBLER.—The following are the only data I possess of its occurrence: a male, Sept. 13, 1886; a female, Aug. 20, a male, Sept. 22, 1887; a male, Aug. 28, 1888.

192. **Helminthophila celata.** ORANGE-CROWNED WARBLER.—Two have been taken: a male, Oct. 21, 1887, and a female, April 24, 1889. This one alone of the *Helminthophilæ* has been procured during both migrations.

144. **Helminthophila peregrina.** TENNESSEE WARBLER.—The summary of later specimens secured, given below, shows that this member of the genus is not wholly uncommon here. Whether it is as plentiful every fall, can be satisfactorily determined only by a continuance of the methodical study of woodland Warblers conducted during the seasons when the specimens were taken. It has not been detected in spring.

1886: Sept. 8, one; 9, two; 28, one; Oct. 1, one; 2, two; 6, one; 9, one.

1887: Oct. 4, two; 5, five; 6, one; 15, one.

1888: Oct. 3, one; 8, two; 9, one.

35. **Dendroica tigrina.** CAPE MAY WARBLER.—Cape May Warblers are not common in this vicinity. April 15 to May 3, and October 4 to 26, are the limits within which they have been obtained. In autumn they become extremely fat. Two females, shot Oct. 4, 1888, were so obese that I was completely puzzled for a moment as to what they really were.

34. **Dendroica maculosa.** MAGNOLIA WARBLER.—Migratory; rather common. Journeying northward, they pass through during the first two weeks of May. Coming southward, they reappear in September—Sept. 3, the earliest instance. Until the closing week of this month they are seen but infrequently, the main body not arriving until about Oct. 1. Before the end of a fortnight all disappear. In song during their spring visitations.

193. **Dendroica cærulea.** CERULEAN WARBLER.—The work of recent years has proved that this bird is a regular migrant, though rather rare. It has occurred in spring from April 13 to 30, and also late in summer and in fall, Aug. 8 to Oct. 22. Its presence so soon in August leads to the inference that it breeds near at hand in the mountains.

33. **Dendroica pensylvanica.** CHESTNUT-SIDED WARBLER.—In spring they pass quickly, appearing the last week of April and disappearing by the 15th of May. They do not seem to be very common during this migration. Returning, the first reach here about the middle of August—16th and 17th in 1887. Their stay is prolonged, normally, until about the second week of October—Oct. 19, 1887, latest record. During the southward passage they become very common, especially in September. Except in spring, only those in the incomplete attire of the young have been procured. On the way north they sing somewhat.

194. **Dendroica castanea.** BAY-BREASTED WARBLER.—Has been taken but twice: May 14, 1887; May 5, 1888. Both were males.

31. **Dendroica blackburniæ.** BLACKBURNIAN WARBLER.—Rare during the northward movement; very common in the southward. The former progress apparently takes place at the end of April and during the

early part of May, and the latter, from about the beginning of the second week of August to about the middle of October - Aug. 8, Oct. 22, the extremes noticed. The greatest rush usually occurs during the fortnight centring around October 1. These late comers are supposed to be Northerners. Individuals often grow exceedingly fat in autumn. They sing while northbound.

195. **Dendroica dominica albilora** Sycamore Warbler.—The *Dendroica dominica-albilora* group is represented in this section by both *dominica* proper and *albilora*. The two forms, in fall at least, are about equally numerous. Collectively, they are rather common, especially during the migrations. The term of sojourn extends from the end of March (the precise time varying in different years) to about the first of October (March 22-Oct. 4). It has not been ascertained whether true *albilora* breeds here; for the exact status of the breeding birds yet awaits determination. The breeders leave early, and a period of absence intervenes between their going and the coming of the August and September migrants. As would naturally be anticipated, the locality furnishes a goodly supply of intermediates.

28. **Dendroica virens.** Black-throated Green Warbler. — A spring and autumn migrant; tolerably common. March 31-May 9, September 20-October 24, are the earliest and latest dates of its capture. It is eminently an October Warbler during fall. In full song in spring.

196. **Dendroica kirtlandi.** Kirtland's Warbler.—The taking of a female, Oct. 11, 1888, has previously been noticed in this journal (Vol. VI, Jan., 1889, p. 74). The geographical position of South Carolina, midway between the Bahama Islands and the States of Ohio and Michigan, suggests that this bird, which was here late in the southward migration, was something more than a mere wanderer.

38. **Dendroica palmarum.** Palm Warbler.—As a winter resident the Palm Warbler can scarcely be regarded more than a straggler. Through the past three winters only one was seen, which shows that protracted mild weather does not exert a controlling influence over its presence by causing greater abundance. In the southward migration it is abundant. The first begin to appear about the second week of September. Usually by the latter part of October the bulk have passed. In spring it remains through April,—the chief month of its northward movement,—but it does not become as plentiful then as in autumn. *D. hypochrysea*, in winter, is even rarer and more uncertain. In fall, also, it is rare, but during April it seems to be as numerous as *palmarum*.

40. **Seiurus aurocapillus.** Ovenbird. — Migratory; common. A month, from about the middle of April to the middle of May, is consumed in the northward passage, and over two months, from the beginning week of August (7th earliest capture) to the middle of October, in the southward. A belated female, taken Oct. 29, is an extreme instance of tardiness. While passing through in spring the ordinary song notes are vigorously pronounced.

197. **Seiurus noveboracensis notabilis.** Grinnell's Water-thrush.—

Considered from the standpoint of the widened diagnosis of the 'Manual of N. A. Birds,' the prevailing Water-thrush of this locality is *notabilis*. With the exclusion of a single example, all that have been taken are of medium and small size. True *noveboracensis* is a *rara avis* in this section. Intermediates are more common. Some of them are so fairly midway between the two forms as to render impracticable their being assigned to either. Migrant only; April 28-May 28; September 1-29. Rather common.

198. **Seiurus motacilla.** Louisiana Water-thrush. — This species has been taken only upon three occasions, viz., Aug. 10, 1887; July 25 and 31, 1888.

42. **Geothlypis formosa.** Kentucky Warbler. — It is a periodic visitant at the close of April and early in May, and again during the first part of September; but it is rather rare. Sings with effect in spring.

199. **Geothlypis agilis.** Connecticut Warbler. — The general rarity of spring specimens, especially enhances the value of the solitary one (a male) in my collection, labelled May 10, 1889.

146. **Sylvania mitrata.** Hooded Warbler. — Up to the present the Hooded Warbler has not been discovered breeding, but it is expected that a thorough exploration of the river region will establish the fact. It is quite common during both migrations, having been observed from April 16 to May 6, and Aug. 6 to Oct. 17. The last date is exceptionally late, the season properly closing with September. While *en route* to their breeding grounds, they sing.

200. **Sylvania pusilla.** Wilson's Warbler.—In all these years but a single individual, shot May 10, 1887, has fallen to my gun.

45. **Sylvania canadensis.** Canadian Warbler.—Rare or casual in fall (September); not uncommon at times in spring (first two weeks of May), when they render themselves conspicuous by their frequent singing.

46. **Setophaga ruticilla.** American Redstart.—Between my latest sping (May 21) and earliest summer (July 10) record, there is a gap of but seven weeks. The July birds are few in number, and usually appear during the last week of the month. Through August decided movements take place, and about the middle of September the full tide reaches here. Then for a while they are among the most abundant of sylvan inhabitants By the first of October a considerable decline has been witnessed, although they are still common. After the third week, at farthest, they are no longer seen. From about the second week of April (April 10, first) through the third week of May, they have been met with in spring. During this vernal progress they become very common, and are not infrequent musicians.

20. **Thryothorus bewickii.** Bewick's Wren.—Breeds very sparingly. They are conspicuously common (perhaps more so in certain seasons than in others) during their migrations, which occur, mainly, in the latter part of September, in October, February (particularly the last portion) and March. In December and January, in some years, they

are rather common, and in others they are almost wholly wanting—the local centre of abundance having been transferred to some other locality. This shifting of habitat does not seem to be imputable to cold, as it was illustrated in a marked manner the past winter, 1889-90 For a week, at the close of December, 1889, there appeared to be a slight influx of these Wrens independent of the general migratory movement. In spring and autumn, and during genial days in January and February, they are exquisitely vocal.

201. **Troglodytes aëdon.** House Wren. — Abundant as this bird is said to be in some parts of the State, I have seen but two, and these, May 4, 1888.

143. **Cistothorus stellaris.** Short-billed Marsh Wren.—No special search has been made for this Wren. Three, however, have been incidentally shot since the original one was procured—Oct. 8, 10, 1885; Oct. 5, 1888.

16. **Sitta canadensis.** Red-breasted Nuthatch —For a long time the idea of extreme rarity was associated with the name of this Nuthatch. Over nine years passed before the example of the 'Partial List' was duplicated. Latterly so many have been collected that it now seems that they must have been overlooked in former years. The first intimation of their comparative abundance came with the securing of three males in October, 1886; two on the 2d, and the remaining one on the 13th. September 28, 1888, a female and two more males were added to the previous number; and in 1889 a female, Oct. 19, a male, Dec. 14, a female and three males, Dec. 21. The last belonged to a little party that was quartered in a pine grove along with a company of Brown-headed Nuthatches, several White-breasted Nuthatches, and a group of Pine Warblers. This was the first time I ever had the pleasure of finding these three Nuthatches together in the same piece of woods, and the experience of shooting them in succession was highly novel. Boreal weather is manifestly not to be accounted the cause of their advent, for the thermometer ranged around 70° F. at midday for some time before and after.

202. **Turdus fuscescens salicicolus.** Willow Thrush.—A typical male was secured Oct. 5, 1888 (Auk, VI, 194). Until an exhaustive study of the 'Wood Thrushes' (*Hylocichla*) has been made, the true position of this Western subspecies in this section must remain uncertain.

203. **Turdus aliciæ bicknelli.** Bicknell's Thrush.—Of this miniature form of the Gray-cheeked Thrush, two characteristic exemplifications have been obtained—a male, May 6, and a female, Sept. 17, 1887. *T. aliciæ* is common, and is here as a temporary resident during the first three weeks of May and from the last of September to about the 15th of October.

(*To be concluded.*)

THE PRESENT STATUS OF THE IVORY-BILLED WOODPECKER (*CAMPEPHILUS PRINCIPALIS*).

BY EDWIN M. HASBROUCK.

THE LAST fifty years of American ornithology have witnessed the gradual diminution of several of our species of birds once extremely common, and with two in particular this amounts to practical extermination. The first of these to disappear was the Great Auk (*Plautus impennis*) last heard of in 1844; the second, the Labrador Duck (*Camptolaimus labradorius*), was formerly common as far south as Chesapeake Bay, but is now exceedingly rare and perhaps extinct.

For some years it has been a common belief that two more species were fast following in the same direction; the Carolina Paroquet (*Conurus carolinensis*), and the Ivory-billed Woodpecker (*Campephilus principalis*). Mr. Chapman, in his search for the Paroquet, proved conclusively that it is by no means so nearly exterminated as formerly supposed, and in a paper* before the Linnæan Society of New York showed that it is still more or less common in the wilder and more remote parts of Florida; and an attempt will be made to show that the bird in question, while by no means as abundant as *Conurus*, is still found in greater or less numbers in many parts of the southern United States, the Mississippi Valley, and in Texas. By many the Ivory-bill and Paroquet are associated together on account of their rarity and almost identical distribution, and for this reason the two are cited here as parallel cases.

The collection of data concerning the relative abundance and distribution of *Campephilus principalis* has for some time past been to me of considerable interest, but not until recently has the material taken such shape as to warrant publication. My personal experience with the species has been extremely limited, although I have had the pleasure of meeting with it in central Florida on one memorable occasion referred to farther on; for the present, however, I shall confine my attention to the former and present actual distribution of the Ivory-billed Woodpecker in the United States.

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* Proc. Linn. Soc. New York, March 7, 1890.

The genus *Campephilus* is essentially a tropical one, embracing thirteen species, all confined to America, there being nothing approaching it in the Old World. Of these, two only are closely related to *principalis:* the Imperial Woodpecker (*C. imperialis*), the largest of the genus, found in the Sierra Madre region of Mexico (the extreme western slope of the Sierra Madre Mountains, on the eastern and western borders respectively of the provinces of Durango and Sonora), and *C. principalis bairdii*, a subspecies of the Ivory-bill found in northern Cuba. *Principalis* will, therefore, be readily recognized as the northern representative of the entire genus. There is a chance that *imperialis* follows the mountain region northward into southern Arizona, as record * shows that it has been taken in Mexico within sixty miles of the northern border, but as yet no instance is known of its occurrence within the limits of the United States.

In regard to nesting habits the same may be said as of other species seldom met with,—'little enough is known about them'; consequently a few notes derived from other sources may not come amiss. In an article by Maurice Thompson entitled 'A Red-headed Family,' is the following interesting account of the nest:

. . . . "I looked and saw two large round cavities, not unlike immense auger holes, running darkly into the polished surface of the stump, one about six feet below the other, the lower twenty-five feet above the ground. . . . . I reached the determination that it was my duty to rob that nest in the interest of knowledge. . . . . I made minute examinations of the rifled nest, and also tore out the other excavation, so as to compare the two. They were very much alike, especially in the jug shape of their lower ends. From a careful study of all the holes (apparently made by *Campephilus*) that I have been able to find in either standing or fallen trees, I am led to believe that this jug shape is peculiar to the Ivory-bill's architecture, as I have never found it in the excavations of other species, save where the form was evidently the result of accident. The depth of the hole varies from three to seven feet, as a rule, but I found one that was nearly nine feet deep, and another that was less than two. Our smaller Woodpeckers, including *Hylotomus pileatus*, usually make their excavations in the shape of a gradually widening pocket, of which the entrance is the narrowest part."

In the possession of Maj. B. F. Goss, of Pewaukee, Wisconsin, is a set of five eggs taken in Jasper Co., Texas, near the

* Specimen in Smithsonian Institution.

Neches River on May 3, 1885, which are said to be the only ones known in collections. Mr. Goss informs me that the nest was "situated forty feet from the ground, with the excavation nearly two feet deep and large enough to insert the arm; the eggs lay on the bare wood, are quite pyriform in shape, glossy white, and measure 1.44 × 1.06, 1.45 × 1.06, 1.44 × 1.07 inches."

Audubon gives the number laid by this species as eight; others, from five to eight; while according to Coues six may be considered as an average; and in the nest found by Mr. Thompson, already mentioned, five were found to be the complement. The only account concerning the young that has been found is that by Mr. W. E. D. Scott, in 'The Auk' (Vol. V, 1888, p. 186) under date of March 17, 1887, at Tarpon Springs, Florida, which is quoted substantially as follows:

"Found nest of Ivory-billed Woodpecker, and obtained both parent birds and the single young bird which was the occupant of the nest. . . . . The opening was oval in shape, being three and one half inches wide and four and a half inches high. The cavity . . . . was cylindrical in shape and a little more than fourteen inches deep. The young bird in the nest was a female, and though over one third grown, had *not yet opened its eyes*. The feathers of the first plumage were apparent, beginning to cover the down, and were the same in coloration as those of the adult female bird."

The first definite records of its distribution and habits are those of Audubon and Wilson, both of whom give pleasing accounts of this species, though they appear to have approached its region of habitation from different directions. The former, in his 'Ornithological Biography,' published in 1832, says: "We first met with this magnificent Woodpecker near the junction of the Ohio with the Mississippi River, where it is frequently observed south from this locality, and northward towards the Missouri River." Wilson * informs us that he "first observed it twelve miles north of Wilmington, North Carolina," and here it may be well to call attention to the fact that this is the most northern actual record for the Atlantic coast. In a paper by Coues and Yarrow, † however, on the natural history of Fort Macon, North Carolina, published in 1878, is the following statement: "Information was

* Birds of America.

† Proc. Acad. Nat. Sci. Phila., 1878, 21-28.

received from an apparently respectable source of the occurrence of this species whose appearance was described with tolerable exactness, but the statement is given for what it may be worth, no specimen having been seen." In preparing the map, therefore, it has been deemed best to include Fort Macon within the area of distribution, which, almost to an absolute certainty, marks the northern range in the east.

The records of Audubon and Wilson are in the thirties, and from that time on various accounts of the relative abundance of *Campephilus* throughout its habitat have been published; the majority relating to its occurrence in the Gulf States, where its true home may be said to be; but it has been the aim in this paper to show the most northern records and those relating to its general distribution for the past ten years. To find the former range was a comparatively easy task, as it was necessary only to search the literature, while to determine its present status, not only were published records consulted, but many letters were sent to competent persons in the Southern States and the Mississippi Valley requesting such information as could be given in regard to it. In using the material collected, many allowances had to be made, — some replies were vague, almost worthless, while others assisted materially in preparing the present paper, but to all who so courteously responded I wish to express my warmest thanks and appreciation, and especially am I indebted to my friend, Mr. Robert Ridgway, for the courtesy shown in many ways. In arranging the dates, the dividing line has been placed at 1880, all records prior to that being considered as coming under former distribution, and all within the past decade as showing the present distribution.

On the map all that area bounded by the heavy black line represents the region as a whole in which the Ivory-bill has been observed, the part in shade represents an attempt to outline the present distribution, based on the records for the last ten years and the information received from various sources, while the single isolated spots in black show the localities of comparatively recent capture. A careful examination of recent records shows that *Campephilus principalis* is now confined to the low swamp country along the coast. This area, for the most part below one hundred feet in elevation, is characterized by dense forests of bald cypress (*Taxodium distichum*) in strong contrast to the pine barrens of the uplands. It will be convenient, therefore, to con-

sider the hundred foot contour as the line marking in general the boundary between the cypress swamps and the pine barrens, and consequently the boundary of the present distribution of the Ivory-billed Woodpecker.

As before stated, the species is confined almost entirely to country below the hundred foot line, but there are a few extra-limital records that are worth considering; these are the Mississippi Valley records for Newport, Arkansas, (elevation from one hundred to five hundred feet above the sea), and Fayette and Kansas City, Missouri, (altitude six hundred and fifty and seven hundred and fifty feet respectively) which are explained by the fact that in this vast river basin the slope is so gradual that the cypress swamps in which the bird delights extend farther into the interior of the country.

Beginning now in North Carolina, with Fort Macon and Wilmington, we pass into the pine barrens* of upper South Carolina where Dr. Burnett† mentions it as being resident in 1851. In the collection of Mr. G. N. Lawrence, is a pair taken near Charleston about forty years ago by Mr. John G. Bell. Mr. Lawrence writes that at the time they were procured the species was quite abundant, but that few, if any, are to be found there at the present time.‡ Coues mentions it as "Resident but exceedingly rare," and "chiefly confined to the lower country." Mr. Walter Hoxie writes that prior to 1870 it was common on the Hunting Islands, but is now an exceedingly rare visitor; one specimen was taken on Johnson's Island in March, 1879 or 1880, and two years ago (1888) one was seen on Pritchard's Island.

In Georgia the records are extremely scarce, the only one at hand being the nest found by Maurice Thompson, already cited; his was in the southeastern part of the State in the Okefinokee swamp, but lacks the important item, the date.

Next in line comes Florida. In no other State is the pine line § so well marked or so closely connected with the distribu-

* The pine barrens of upper South Carolina consist for the most part of the following counties: Burnwell, Darlington, Marion, Marlborough, Orangeburg, and Sumter.

†Proc. Bost. Soc. Nat. Hist. IV, 115-118.

‡Proc. Bost. Soc. Nat. Hist. XII, 1868, 104-127.

§ It may be well to state specifically what is termed the pine line. To begin with, such a line is extremely difficult, if not next to impossible, to locate, as pine penetrates the cypress in the low lands for a greater or less distance at every point; while, on the other hand, cypress ceases entirely as soon as higher ground is reached, and it is this line marking the limit of the cypress that I have attempted to show and to define.

tion of this Woodpecker, and, as might be expected, many records are to be found; in fact, so admirably adapted to the wants of this bird is by far the larger portion of the State, that there are here more actual instances of its capture than in all the rest of the States east of the Mississippi.

It will consume too much time to mention more than a few important records. At Cedar Keys it was taken on January 31, 1859 (specimen in Smithsonian Institution). Mr. S. C. Clarke* writes: "In 1872 I procured a male near New Smyrna, Volusia County"; he also heard some in 1870 at Merritt's Island. Mr. Scott states (in the article previously referred to), "the same day that the nest was found eleven were counted in the swamp in question, sometimes four or five being in sight at once"; while in 'Forest and Stream,' XXIV, 427, 'W. A. D.' of Hawkinsville, Orange County, writes that he and his two brothers had killed between twenty and twenty-five of these birds during the past ten years, for a taxidermist in Palatka. The last one seen was on May 4, 1885. While in Florida in 1886, the writer saw one of these self-same birds stuffed and mounted. On March 8, 1886, Mr. H. A. Kline† killed one on St. Mark's River, near Tallahassee, and a few weeks previous saw two others in the same locality. In the Smithsonian collection is a magnificent specimen taken by Major Byrnes, at Bristol, Liberty County, December 7, 1889. For the present year (1890) the records, so far as known, are two in number: on March 27, an acquaintance, Captain Gregg, a veteran hunter, informed me that he had recently returned from a hunting trip on the Wacissa River, in Jefferson County, and that among other birds, the Ivory-billed Woodpecker was quite common; that he had killed two, but not knowing how to skin them, they were thrown away. I questioned Captain Gregg closely regarding the birds, and there is no doubt in my mind that they were *Campephilus*. The other specimen was taken by Mr. Frank M. Chapman on the Suwanee River, twenty miles from the mouth, on March 24. Mr. Chapman's testimony is that this was the only bird met with during the three weeks passed on the river and, from the information gathered that it is there an extremely rare bird. The most southern record for the State is furnished by Mr. William Brewster, who obtained three specimens from Dade County in 1889, while a single individual was offered to Mr. Charles B.

* Forest and Stream, XXIV, 367.

† Forest and Stream, XXIV, 163.

Cory, claimed to have been shot near Fort Myers, on the Caloosahatchie River. Mr. Frederick Ober, in his report of the trip through the Okeechobee region,* claims to have seen what he took to be *Campephilus*, but failed to secure a specimen. It is probable that it occurs there, but as expeditions into this region are few, it is not surprising that there are no records. In the collection of Mr. Brewster † is a series of fourteen specimens taken from 1876 to 1889 inclusive, all of which, with the exception of two taken in 1876, were collected within the past ten years; these, together with the foregoing records, prove beyond doubt that the State of Florida is the centre of abundance of the Ivory-bill.

My own experience with the species, although limited, is as follows:—I had been spending the winter of 1885-1886 in Florida, and during the month of March had made my headquarters at the home of my friend, Mr. E. G. Smith, on Big Lake George. One of my favorite trips was up Juniper Creek, a small stream emptying into the head of the lake one mile west of the famous Volusia bar; the country through which it passes is one of those wild, semi-tropical swamps, so common throughout the Gulf States. Anhingas (*Anhinga anhinga*), Little Blue Herons (*Ardea cærulea*), Egrets (*A. egretta*) and Limpkins (*Aramus giganteus*) were by no means uncommon, and it was in search of these that Mr. Smith and I took a boat on March 26 and started for this locality. We took with us as oarsman 'Jim' (one of the help on the place), who had done considerable collecting for me, and in whose accuracy as a marksman I had some confidence. We had gone perhaps a mile up the stream when a new and peculiar note sounded from the forest, which I can only liken as do other writers to the false high note of a clarionet; hastily landing I immediately went in search of its author (as I had not the faintest idea from what source it proceeded), but owing to the thickness of the underbrush it was next to impossible to penetrate farther than a few yards and, the noise ceasing entirely, I returned and we continued up the stream. Noon found us eating our lunch on a small knoll some four miles from the lake in the very thickest of the swamp. Around us stood gigantic cypress trees whose trunks and branches were adorned with thousands of air plants, and from which the myriads of vines which twined and twisted, and the gray Spanish moss hanging in long

*Forest and Stream, April 23, 1874.

†See tabulation of records.

festoons, cast a gloom and solemnity hard to realize by one who has never seen it, yet lending a certain grandeur that the student of nature is not slow to appreciate. Scattered through the swamp and giving a tropical air to the whole were countless palmettoes (*Sabal palmetto*) towering to a height of seventy-five or a hundred feet, and it was in a little clump of these that we were taking our nooning. Suddenly that strange note sounded once, twice, three times,—approaching nearer with each repetition. It sounded exactly like the note of the White-bellied Nuthatch, only much louder and stronger, and grasping my gun, I remarked that I was going to kill the biggest Nuthatch on record. Hardly had the words left my lips when, with a bound and a cackle, a magnificent male Ivory-bill alighted in the trees directly over our heads; for a moment I was too astonished to speak, but in that moment it was joined by its mate, and the two began hammering away at the palmetto trunks. It was impossible for me to shoot without changing my position, while to move would be to alarm the birds; Jim saw my dilemma and whispered that he could kill them from where he sat, so passing him the gun I watched him take aim. He fired but missed, and the Woodpeckers bounded away into the thickest part of the swamp; hastily snatching the gun I started in pursuit, but failed to find them. Day after day I returned to the same locality in hope of securing them, but without success, and on April 7 I was obliged to leave for home without adding this much coveted species to my collection.

Mr. Hoxie, who has spent much time in the haunts of the Ivory-bill in Florida, informs me that the Seminole name for it is 'Tit-Ka,' and there is a tradition that during a contest of strength it tapped so hard with its bill that the blood and brains flew out of the back of its head.

In Alabama Gosse* mentions it as not at all rare at Dallas in 1859; in 1865 it was taken on the west side of the Tombigbee River in Marengo County, and in 1866 Mr. W. C. Avery shot a female at Millwood on the Black Warrior River, ten miles west of Greensboro. At Crump Springs on the Buttahatchie in the spring of 1886 Mr. G. V. Young observed it nesting in a dead pine, some seventy feet from the ground, and in the fall of 1889 he identified one in Wilcox County while on a deer hunt. It is rare and seldom seen, but confined to the lower swamp country.

* Gosse, 'Letters from Alabama,' 1859, 91.

In Mississippi Prof. Wailes* speaks of it as follows:

"Chief of his tribe, the majestic Ivory-bill Woodpecker cleaves his way through the air, in a series of peculiar and singularly graceful undulations . . . . 'Disdaining the grovelling haunts of the common herd of Woodpeckers,' he seeks his favorite resorts in the loftiest trees in the most secluded forests, and from the blasted arms of the lordly cypress or the mast-like trunk of the towering pine sends forth his clear and clarion notes, and startles the ear with the resounding strokes of his powerful beak."

Mr. Young (already mentioned) writes from Waverly, Clay Co.,—"In the early settlement of this section the Ivory-bill was very common, but since the country has become settled, the species, naturally wild, has retired to the unfrequented parts of the forest and is rarely seen here now (1890). I saw a beautiful specimen in Monroe County in 1885 on the Tombigbee River, while in the flat woods beyond Houston they are frequently met. I have seen quite a number recently in the Mississippi bottom, which is now a favorite place for them, as the timber, which has been deadened, furnishes them with all the material necessary for a good living, and my observation leads me to the belief that a red oak timbered country is their favorite feeding ground in this region." In January, 1885, Mr. Maurice Thompson secured a specimen at Bay St. Louis, and according to Mr. Rawlings Young, of Corinth, it is still found in the Yazoo Delta, and along the Mississippi River.

Its presence in Louisiana rests on two records:—the first, a specimen at the Smithsonian taken at Prairie Mer Rouge, Moorhouse Parish, in 1853; the second, an account of its being seen at St. Joseph, Tensas Parish, by Mr. Gideon Mabbett, and for which no date is given. This scarcity of records is not surprising when the nature of the country and the class of people inhabiting by far the larger part of it is taken into consideration, and the same may be said of Arkansas, Missouri and Tennessee,—that in swamp country where the main object in life is to raise sufficient during the summer months for sustenance throughout the winter, little scientific element is to be found.

Texas, however, has a somewhat better showing,—the testimony of Mr. G. H. Ragsdale being that in the early settlement of Cooke County it is reported from that locality, but is not found

* Rep. Agric. and Geol. Miss. 1854, 323-324.

there now; and Audubon* mentions it as very abundant along Buffalo Bayou. In 1865, Dresser, in his list of Texas birds,† states that the species was "found on the Brazos River, where the timber is large; and a planter on the Trinity River told me that it is not uncommon there. A friend of mine on the Brazos promised to procure the eggs for me, but wrote to me, in May, 1864, saying that he had been to the nest and found it to contain young ones. He said that these birds are by no means rare on the Upper Brazos." Mr. Nehrling‡ states that in 1882 it was very rare in the northern parts of Harris and Montgomery Counties, while last but not least is the record of Mr. Goss, in Jasper County in 1885, already mentioned.

Returning to the Mississippi Valley proper and continuing northward into Arkansas we find that Audubon mentions it as occurring along the Arkansas River; while in 1885 it was still found in the northeastern part of the State, being abundant at Newport.§

At Caddo, Indian Territory, it passed the winter of 1883-1884,§ while in Missouri, according to Mr. Lientz, it formerly bred at Fayette,§ although not known to do so at present, and as far west as Kansas City§ it was observed to pass a few winters immediately preceding 1885.

Indiana, Illinois and Kentucky each have one record (although Audubon mentions it as occurring in Indiana and Kentucky, failing, however, to name any locality). In Franklin County, Indiana, it‖ was a former resident, but none have been seen for many years. Mr. Ridgway states that he "has a distinct recollection of what he believes to have been this species in White County, some forty miles south of Mt. Carmel," Illinois,¶ some time between 1858 and 1860; while Pindar** informs us that it is said to have been formerly common in Fulton County, Kentucky, and that Mr. J. A. Taylor saw several about 1883 or 1884.

For Tennessee no records have been found, although it would seem highly probable that the bird occurs in the bottom lands bordering the Mississippi, especially when we consider the record

* Aud. Orn. Biog. V, 525.
† Ibis, 1865, 468.
‡ Bull. N. O. C. VII, 1882, 170.
§ Miss. Valley Migr. 1888, 128.
‖ Coxe's Geol. Surv. Ind. 1869, 211.
¶ Nat. Hist. Surv. Ill. 1889, 375.
** Auk, VI, 1889, 313.

from Fulton County, Kentucky, just north of and adjoining this State, and also those directly south in Louisiana, and west in Arkansas.

It will be seen from the foregoing, that in many instances the accounts are modified with the statement that the species is extremely rare as compared with past years, or else has disappeared from the localities entirely. Probably this is not altogether owing to the actual decrease in the numbers of the birds, but to its extreme wildness and desire for seclusion;—"Savage liberty is a pre-requsite of its existence, and its home is the depth of the woods remotest from the activities of civilized man." As a result many of those regions which were formerly its haunts have been abandoned for the wilder and more inaccessible parts of the forest. Audubon relates the finding of a nearly completed nest, and, on his being discovered in the vicinity by the owners, of its immediate abandonment. Surely a bird as wild, as wary, as this would not remain in the vicinity where man was constantly to be met! There are thousands of square miles of swamp throughout the Mississippi Valley and Gulf States that never will or can be reclaimed or settled, country that is admirably suited to this bird, and in which, as I have shown, it is much more common today than elsewhere; and here, it is safe to say, it will be found indefinitely; for, into those swampy fastnesses in which it most delights, few care to penetrate, at certain seasons none dare; and as but few are killed, and each pair in existence today will presumably raise its brood the coming spring and together with them repeat the multiplication each successive year,—it is reasonable to assume that the species will be found there many years hence.

To conclude, it would appear that prior to 1860 the Ivory-billed Woodpecker was distributed from Fort Macon, N. C., along the coast as far west as the Brazos River in Texas, and extending towards the interior for an average distance of seventy-five miles; in the Mississippi Valley as far inland as central and western Missouri, southern Illinois, Indiana, and western Kentucky, together with a portion of Indian Territory. From 1860 to 1880, it had retired before the march of civilization from many of its former haunts, forsaking entirely Indiana, Illinois, North Carolina and all but the extreme eastern portion of Texas; while from 1880 to 1890 (although a characteristic bird of the Austroriparian region) it has practically confined its abode to the denser swamps bordering the South Atlantic and Gulf States.

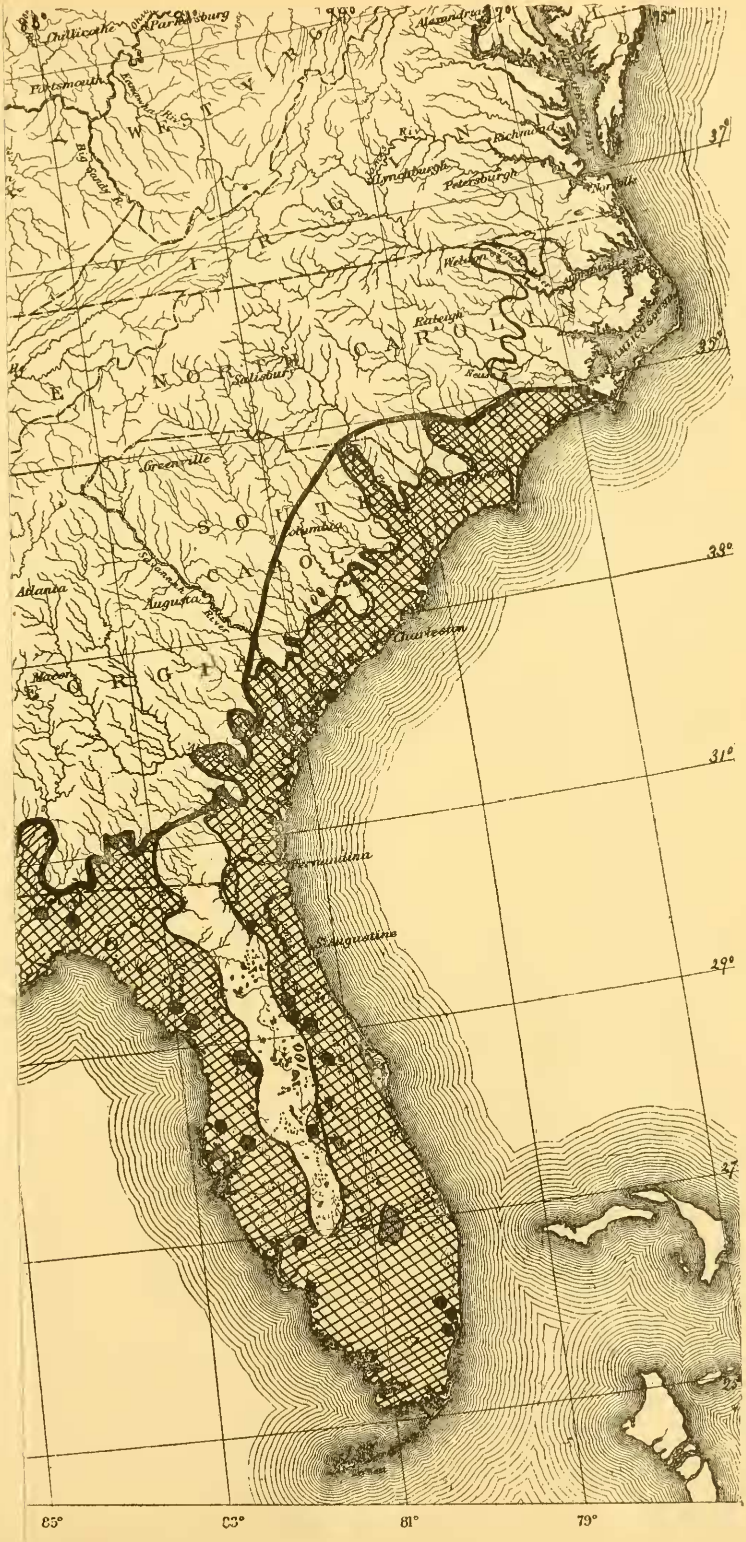
TABLE SHOWING THE FORMER DISTRIBUTION OF *Campephilus principalis.*

North Carolina		
Wilmington		Wilson, Am. Orn.
Fort Macon	?	Coues and Yarrow.*
South Carolina		
Pine Barrens	1851	Burnett.‡
Charleston	About 1850	Lawrence coll., 2 specimens.
Hunting Islands	Prior to 1870	Hoxie, in epist.
Johnson's Island	March, 1879 or 1880	" " "
Georgia		
Okefinokee Swamp		Thompson, 'Red-headed Family.'
Florida		
Cedar Keys	Jan. 31, 1859	Smith. Inst. coll.
Enterprise	March 26 & 29, 1861	Ibis, IV, 1862, 127–197.
Volusia	February 12, 1869	Allen, 'Mamm. & Winter Birds of East Florida' (3 spec.).
Enterprise	March 5, 1869	Allen, 'Mamm. and Winter Birds of East Florida' (3 spec.)
Hawkinsville	March 15, 1869	Ibid.
Merritt's Island	1870	S. C. Clark, F. & S. XXIV, 367.
New Smyrna	1872	" " " " "
Wekiva River	June 7 & Aug 23. 1876	Brewster: collection (2 spec.).
Wekiva River	Sept. 7, 1877	Smith. Inst. coll.
Lake Monroe	1877 & 1878	" " "
Lente's Landing	Winter of 1878–79	Merriam, notes before Linn. Soc., New York 1879.
Fort Myers		Cory, in epist.
Alabama		
Dallas	1859	Gosse, 'Letters from Alabama.'
Marengo Co.	1865	W. C. Avery, in epist.
Millwood	1866	" " " "
Mississippi		
———	?	Wailes§
Clay Co.		G. V. Young, in epist.
Louisiana		
PrairieMerRouge	1853	Smith. Inst. coll.
Texas		
Cooke Co.		G. H. Raysdale, in epist.
Buffalo Bayou		Aud, Orn. Biog. V, 525.
Brazos & Trinity Rivers	1865	Dresser, Ibis, 1865, 468.
Arkansas		
Along Arkansas River		Aud, Orn. Biog. I, 1832, 341.
Illinois		
White Co.	1858–1860	Ridgway, Nat. Hist. Surv., Ill., 1889, 375.
Indiana		
Franklin Co.		Coxe's Geol. Surv., Ind., 1869, 211.
Missouri		
Fayette		Cooke, 'Bird Migration in Mississippi Valley,' 1888, 128.

*Coues and Yarrow, Proc. Acad. Nat. Sci., Phila., 1878, 21–28.
‡Burnett, Proc. Bost. Soc. Nat. Hist. IV, 115–118.
§Wailes, Rep. Agri. & Geol. Miss., 1854, 323–324.

TABLE SHOWING THE PRESENT DISTRIBUTION OF *Campephilus principalis.*

South Carolina		
Pritchard's Island	1888	Hoxie, in epist.
Florida		
Rosewood	Nov. 24 & Dec. 3, 1881	Brewster collection (2 spec.).
Panasoikee Lake	1881	Scott, Bull. N. O. C. VI, 14–21.
Withlacoochee River	"	" " " " "
Clearwater	"	" " " " "
Tampa	Sept. 20, 1883	Brewster collection.
Hawkinsville	May 4, 1885	'W. A. D.' F. & S. XXIV, 427.
St. Mark's River	March 8, 1886	Kline, F. & S. XXVI, 163.
Wekiva River	1886	Boardman, " " "
Juniper Creek	March, 1886	E. M. Hasbrouck.
Linden	March 30, 1886	Brewster collection.
De Soto Co.	Feb. 3, 1887	" "
Tarpon Springs	March 17, 1887	Scott, Auk, V, 186.
Dade Co.	May–June, 1889	Brewster collection (3 spec.).
Davenport	June 16, 1889	" "
Cypress	July 1, 1889	" "
Polk Co.	July 5, 1889	" "
Bristol	Dec. 7, 1889	Smith. Inst. coll.
Wacissa River	Winter, 1889–90	Gregg (informant).
Suwanee River	March 24, 1890	Chapman, in epist.
Alabama		
Crump Springs (Buttahatchie River)	1886	G. V. Young, in epist.
Wilcox Co.	1889	" " " "
Mississippi		
Monroe Co.	1885	" " " "
Bay St. Louis	Jan., 1885	Thompson, 'Red-headed Family.'
Mississipi bottoms	Recently	G. V. Young, in epist.
Yazoo River delta	1890	B. Young, in epist.
Louisiana		
St. Joseph	?	Gideon Mabbett, in epist.
Texas		
Harris Co.	1882	Nehrling, Bull. N. O. C. VII, 170.
Montgomery Co.	1882	" " " " "
Jasper Co.	May 3, 1885	B. F. Goss, in epist.
Arkansas		
Newport	1885	Cooke, 'Bird Migration in Mississippi Valley,' 1888, 128.
Indian Territory		
Caddo	Winter 1883–84	Cooke, 'Bird Migration in Mississippi Valley,' 1888, 128.
Missouri		
Kansas City	About 1884	Cooke, 'Bird Migration in Mississippi Valley,' 1888, 128.
Kentucky		
Fulton Co.	About 1883	Pindar, Auk, VI, 313.



Chillicothe
Parkersburg
Alexandria
Portsmouth
W E S T V I R G
V I R G
Richmond
Lynchburgh
Petersburgh
Norfolk
Weldon
Raleigh
N O R T H C A R O L I
Salisbury
Greenville
S O U T H
Columbia
C A R O L
Augusta
Atlanta
Charleston
Macon
G E O R G I
Fernandina
St Augustine
37°
35°
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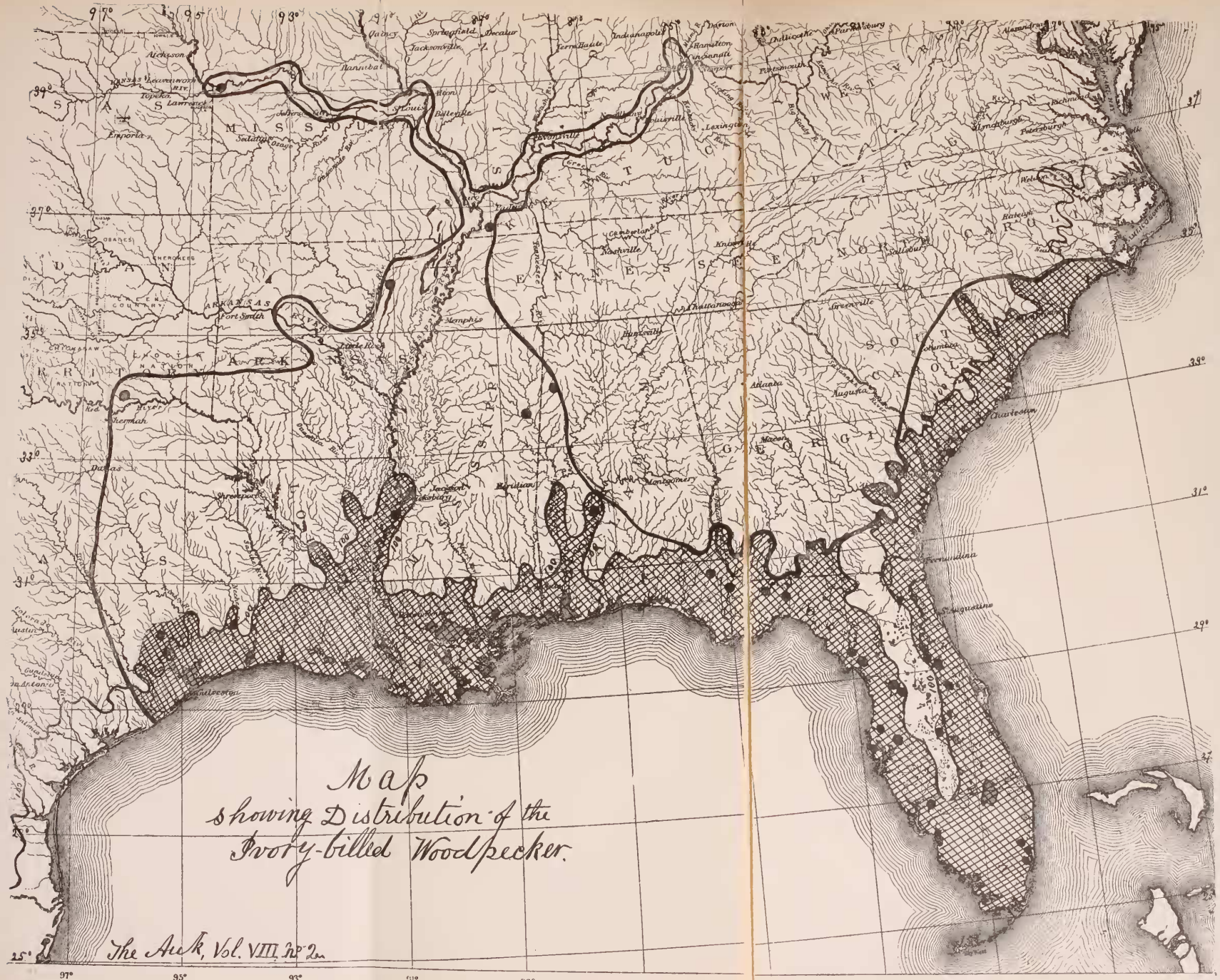
29°
27°
85°
83°
81°
79°


Map
showing Distribution of the
Ivory-billed Woodpecker.
The Auk, Vol. VIII, Pl. 2.
97°
95°
93°
91°
89°
87°
85°
83°
81°
79°
39°
37°
35°
33°
31°
29°
27°
25°
MISSOURI
KENTUCKY
TENNESSEE
ARKANSAS
LOUISIANA
MISSISSIPPI
ALABAMA
GEORGIA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
INDIANA
ILLINOIS
KANSAS
INDIAN TERRITORY
Kansas City
Springfield
Decatur
Jacksonville
Terre Haute
Indianapolis
Hannibal
St. Louis
Belleville
Lexington
Louisville
Nashville
Memphis
Little Rock
Fort Smith
Shreveport
Vicksburg
Natchez
Meridian
Montgomery
Atlanta
Augusta
Columbia
Charleston
Wilmington
Raleigh
Salisbury
Greenville
Chattanooga
Knoxville
Cumberland R.
Big Sandy R.
Kanawha R.
Pittsburgh
Parkersburg
Alexandria
Richmond
Petersburg
Norfolk
Hamilton
Dayton
Cincinnati
Portsmouth
Dalton
Atchison
Leavenworth
Lawrence
Topeka
Emporia
Osage River
Arkansas River
Red River
Sherman
Dallas
Texarkana
Galveston
Houston
Austin
Corpus Christi
Brownsville
Matamoras
Monterey
Tampico
Vera Cruz
Havana
Key West
Tortugas
Bahama Islands
Florida
St. Augustine
Fernandina
Savannah
Mobile
New Orleans
Pensacola
Tallahassee
Apalachicola
Tuscaloosa
Huntsville
Florence
Corinth
Paducah
Evansville
Terre Haute
Lafayette
Logansport
Fort Wayne
Toledo
Cleveland
Akron
Wheeling
Zanesville
Columbus
Springfield
Dayton
Cincinnati
Lake Michigan
Lake Erie
Lake Ontario
Lake Huron
Lake Superior
Lake Winnebago
Green Bay
Milwaukee
Chicago
Rock Island
Peoria
Quincy
Hannibal
St. Louis
Cairo
Belleville
Springfield
Jacksonville
Decatur
Terre Haute
Indianapolis
Richmond
Hamilton
Dayton
Cincinnati
Portsmouth
Parkersburg
Wheeling
Pittsburgh
Alexandria
Norfolk
Petersburg
Richmond
Lynchburg
Roanoke
Big Sandy R.
Kanawha R.
Ohio River
Mississippi River
Missouri River
Arkansas River
Red River
Tennessee River
Cumberland R.
Big Black R.
Yazoo River
Pearl River
Alabama River
Tombigbee R.
Chattahoochee R.
Flint River
Ocmulgee R.
Savannah River
Pee Dee R.
Cape Fear R.
Neuse River
Roanoke R.
Chesapeake Bay
Albemarle Sound
Pamlico Sound
Gulf of Mexico
Atlantic Ocean
Florida Keys
Bahama Channel
Gulf Stream

NOTES ON SOME SPECIES OF BIRDS OF THE ISLAND OF CUBA.

BY DR. JOHN GUNDLACH.

Calypte helenæ *Gundl.*

In the synonymy given by Mr. Charles B. Cory in his 'Birds of the West Indies' may be added between *Calypte helenæ* Gould, Mon. Troch. III, pl. 136 (1861), and Gray, Handb. Bds. I, p. 145 (1869), the reference: Gundl. Repert. Fisico-Nat. Cuba, I, 1866, p. 291; and between Gundl. J. f. O. 1874, p. 144, and Muls. Hist. Nat. Ois. Mouch., IV, p. 77 (1877), the reference: Gundl. Contrib. a la Orn. Cuba, 1876, p. 109.

The reference *Orthorhynchus boothi* Cab., J. f. O., is *boothi* Gundl. in Cab., J. f. O., 1856, p. 99, where Dr. Cabanis in a note says that the name *boothi* proposed by me for *helenæ* may be omitted because the species named by De Lattre *helenæ* is not of the same genus.

Mr. Cory gives the color of the head, throat, and elongated feathers of the neck as metallic red, almost pink in some lights, but this color changes in some lights also to golden and green.

Mr. Lawrence records, in Ann. N. Y. Lyc. Nat. Hist. 1860, that the male has a well defined terminal band on the tail, nearly equal to one quarter of its length. In the young males and females it exists also inside of the white tip and occupies more space than in the adult male.

The young male has a more bluish green back than the female, and the tail of the old male is emarginate, and that of the young male (or before the perfect plumage) and the female rounded. I have published in J. f. O. IV, 1856, pp. 99-101, a description of this species.

The first specimen, a young male with only four perfect red feathers on the throat, I killed in March, 1844, near Cardenas, searching a flower of *Hibiscus*. Four years afterwards I found a locality on the border of the mangrove, where the flowers of *Avicennia*, *Hibiscus*, etc., supply much nectar. There I have killed many specimens of both sexes in its perfectly colored head and throat and in its ruff of elongated feathers. The first description of this new species I published in Lembeye's Aves de Cuba, 1850, p. 70. The name *helenæ* is given in respect to Doña

Elena de Faz, wife of Don Carlos Booth, my first protector in this island.

The locality mentioned was afterwards destroyed by a railroad, and I found no more of this little bird at Cardenas. Never have I observed the species in other places in the western part of this island, except in a key near Cardenas. In 1857 I visited the city of Santiago de Cuba in the eastern part of this island, and also in the years from 1885 to 1888. There the species is common in the spring. A friend who resides in Puerto-Principe (the middle part of the island) has observed the species there, and like me only during the months of January to end of April. In May it disappears, but I have observed later single specimens in the interior of the island. It seems that they breed there.

The male has a fine song. This species flies before the flowers in a horizontal direction like moths (sphinges), not like *Chlorestes riccordi* with an inclined body and moving his long forked tail.

My observations seem to prove that the males go through two moults in every year. I have noticed that young males with the plumage similar to that of the female have sometimes no red, perfect feathers on the throat. These may be young ones one year of age. Other specimens have perfectly grown red feathers on the head and throat, but not the ruff of elongated feathers. The tail is emarginated and without the white spots. These are perhaps males of two years of age; and others with the entirely perfect plumage are probably very old males. I will continue my observations.

In Vol. VI, p. 46, of 'The Auk' is an article entitled "Remarks upon abnormal coloring of plumage observed in several species of birds," by George N. Lawrence. The principal object of these remarks was a specimen of *Psittacus* with uniform pale blue plumage, described in 1862 (Ann. Lyc. of Nat. Hist., Vol. VII, p. 475) as a new species from Panama under the name of *Psittacus subcæruleus* Lawr., figured afterwards by Dr. Otto Finsch of the Bremen Museum in 1865 from the original specimen. In 1871 (Ibis, p. 94) Mr. Salvin considers the specimen as an accidental variety of the *B. tovi*.

I have noticed with great interest the explanation given by Mr. Lawrence, and I have noticed two similar cases of blue-colored *Chrysotis leucocephalus* Linn. I am convinced that Mr. Lawrence has good reasons for his opinion. In the blue-colored

Parrots the yellow part of the green color is absent and in albinism the yellow color is absent from the blue part.

Before I arrived in Cuba, in 1839, a blue Parrot was brought from the Island of Pinos (which belongs to the Island of Cuba) to Havana. Many persons have seen this bird. During my residence at the Island of Pinos I tried to obtain information of that species, but without result, and I was of the opinion that the bird was an exotic one, brought first to the Island of Pinos and afterwards to Havana.

In the year 1887 another blue Parrot was captured in the mountains of Guantanamo (the more eastern part of the island of Cuba). The owner was a peasant. When my friend Don Jorge Preval, owner of a coffee estate in his vicinity, received notice of this bird, his intention was to procure the specimen at any price, but a few days before it was sold to a soldier and sent to Santiago de Cuba. I was at that time absent, and after my return I was unable to ascertain whether the Parrot was still at Santiago de Cuba.

Persons who saw this Parrot say that it had the front white and the throat red, like the type of *Chrysotis leucocephala* Linn. I am convinced that both specimens were, like that observed by Mr. Lawrence, only an accidental variety.

Parrots when very old have many red or yellow feathers on different parts of the body, especially when kept in captivity. I have not seen a white Parrot in this island, but have seen an entirely yellow *Chrysotis leucocephalus* with the front white and the throat red.

I have killed also a common Parrot with the front blackish. This is a case of *melanism.* I have this specimen.

A *Xiphidiopicus procussus* Temm., female, killed by me in a key near Cardenas, has a yellow tint on all the green parts. It is the only specimen observed, and may be a variety with a prevailing yellow tint and not a different species.

I have seen or killed many more or less perfect albinos; I give here the list.

Mimocichla rubripes Temm., entirely white.

Geothlypis trichas Linn., ♂, almost yellow, without the black frontal band.

Euethia lepida Linn. (*olivacea* Gmel.), entirely white, and another one with yellow parts.

Sturnella hippocrepis Wagl., entirely white except the yellow throat.

Quiscalus gundlachi Cass., entirely white.

Myiarchus sagræ Gundl., with pale gray, not brown, upper parts.

Crotophaga ani Linn., one specimen uniform pale reddish brown; another specimen with great white spots; another with a great many white feathers intermixed on the throat and neck; another with grayish black on the upper parts.

Saurothera merlini D'Orb., one specimen entirely white and another with intermixed white and yellowish spots.

Centurus superciliaris Temm., white, preserving the red parts; another like specimen is figured in La Sagra's Historia fisica, politica y natural de la Isla de Cuba.

Cathartes aura Linn., entirely white, and another specimen with white spots intermixed.

Patagiœnas corensis Gmel., entirely white, and another specimen of pale gray color.

Zenaidura macroura (*carolinensis* Linn.) with uniform reddish brown color.

Columbigallina passerina Linn., also uniform reddish brown.

Starnœnas cyanocephala Linn., with white spots.

Ortyx cubanensis Gould, entirely white.

Ægialitis semipalmata Bon., with the head, neck, and breast white, with only some feathers of normal color.

Tringa minutilla Vieill., with some white on the upper parts.

Nycticorax violaceus Linn., entirely white.

Spatula clypeata Linn., ♀, very pale colored.

An *Antrostomus carolinensis* Linn., ♀, had the stomach filled with feathers and little pieces of bones (probably of a Warbler), and one of the tail-feathers was colored like those of the male (the inner web white above).

In none of the American authors do I find a satisfactory description of *Pelecanus fuscus*, respecting the color of the head and neck of the different ages. The color of both sexes of the same age is the same. The young bird has the head and neck simply dark brown with a grayish tint; afterwards the head is white and this color extends down the neck as a bordering of the pouch, and somewhat beyond, and there is a white spot on the region of the furcula; the rest of the neck is dark chestnut; the extreme part of the neck between the shoulders has no white. The neck has a more downy and softer plumage than in the young ones. Afterwards the head becomes yellow, the white color which bordered the pouch extends over the whole fore part of the neck; the posterior part is dark chestnut, and the extreme part between the shoulders is white. The occiput has elongated white feathers. The very old bird has the head yellow, all the

neck white, with a yellowish tint toward the shoulders. This is the permanent plumage of the oldest birds. During the moult occur transitions between the different phases of coloring.

DESCRIPTION OF A SUPPOSED NEW *MYRMECIZA*.

BY GEORGE K. CHERRIE.

THERE are in the collection of the Museo Nacional twenty specimens referable to the genus *Myrmeciza*. Thirteen of these come from the eastern side of the great mountain range, and seven from the Pacific lowlands. The form from the Pacific side I suppose to be new. However, without either works of reference or authentically identified specimens, I can feel no certainty about which form really is *M. immaculata*. I do not even know from what locality the type specimen of *immaculata* came. My supposition that the Pacific form is the new one is based on Mr. Ridgway's note under *Myrmeciza immaculata* in a paper "On a collection of birds from the Hacienda la Palma, Gulf of Nicoya, Costa Rica," by C. C. Nutting. (Proc. U. S. Nat. Mus., Vol. V, 1882, p. 398.) Mr. Ridgway says: "The female from La Palma is referred doubtfully to this species. It differs markedly from three other Costa Rican specimens, from the Atlantic coast, in having the jugulum and breast bright chestnut instead of dull chestnut brown, but I am unable to detect any other differences."

With the small series of specimens I have before me, other slight differences are discernible in coloration, besides a decided difference in size, as will be shown in the following descriptions and tables of measurements.

In case the western form may prove to be new, I would suggest the name *occidentalis*,* and characterize the form as follows:

Myrmeciza immaculata occidentalis subsp. nov.

Male (No. 1352, Museo Nacional, Pozo Azul, January, 1887, José C. Zelédon).—Above: whole head slate-black; back, a rather dark vandyke brown, the wings and tail with a more dusky shading. Below: throat

* I employ the name *occidentalis*, at the suggestion of Mr. José C. Zelédon, as indicative of the locality.

and breast slate-black, changing gradually posteriorly to slate-gray on the abdomen; flanks and under tail-coverts vandyke brown, the latter much the brighter; under wing-coverts brownish slate-gray; bend of wing white. "Bare orbital skin, cobalt-blue; iris, chestnut"; bill black. The feathers of the crown are somewhat elongated, but not in the form of a crest. The wings are short and rounded; the first primary is the shortest; the third is about equal to the eighth; the fourth, fifth and sixth are the longest.

Female (No. 1351, Museo Nacional, Pozo Azul, January, 1887, José C. Zelédon).—Above: head slate-black with a shading of vandyke brown commencing on the crown and deepening posteriorly to the cervix where the blackish color entirely disappears, giving place to the rich vandyke brown of the back; wings, rump and upper tail-coverts a little brighter; tail slightly darker. Below: auriculars slate color; chin and throat slate-gray with a slight shading of chestnut from the jugulum; jugulum bright chestnut, changing into hazel brown on the breast; sides of breast, sides, flanks, and under tail-coverts vandyke brown, darkest on the sides of the breast, and brightest on the under tail-coverts; under wing-coverts grayish vandyke brown. "Bare orbital skin, cobalt blue; iris, chestnut." The label of another female (No. 3308) reads: "Upper mandible black; lower, blackish; feet and legs plumbeous; iris, brown." The remaining five examples show considerable individual variation in color. All are a trifle darker on the back, but present an unbroken series of variations. Below, in Nos. 1350, 3308, and 4592, there is only a trace of hazel on the breast, the vandyke brown of the sides taking its place. In Nos. 635 and 4590 the hazel of the breast is replaced by chestnut from the jugulum.

Specimens from the Atlantic side may be compared with those from the Pacific side, and described, as follows:

Male (No 3419, Museo Nacional, Jiminez, August 16, 1889, A. Alfaro) similar to the male described as coming from the Pacific side, differing principally in the relative proportions; however, the back seems a trifle darker; also the head a shade blacker; but with only the single specimen from the Pacific side it is impossible to say whether these differences are constant or not.

Female (No. 3415, Museo Nacional, Jiminez, August 8, 1889, A. Alfaro), above, similar to the females from the Pacific side, but with the head and back a trifle darker. Below, chin and throat a blackish slate; rest of underparts dark vandyke brown, as dark as the sides of the breast of the Pacific form. (Perhaps the color of the underparts would be better described as dark sepia brown.)

A young male (No. 3417, Museo Nacional, Jiminez, August 16, 1889, A. Alfaro) resembles most the female. The head, however, is vandyke brown like the back, only the bases of the feathers being blackish. The wings are blackish, being edged only with the color of the back. Tail blackish, indistinctly barred with narrow white bands, showing most from below. Below, chin and throat slate-gray, heavily washed with the color of the breast, which is somewhat lighter than in the adult bird. Under tail-coverts barred with from two to three black bands.

MEASUREMENTS (in inches).

M. immaculata occidentalis

					Wing	Tail	Tail feathers	Exposed culmen	Tarsus
♀	635	A. Alfaro	Trojas	Feb., 1886	2.58	2.15	1.75	.77	1.10
♀	1350	J. C. Zelédon	Pozo Azul	Jan., 1887	2.68	2.15	1.81	—	1.03
♀	1351	"	"	"	2.66	2.13	1.84	.73	1.11
♀	3308	"	"	Sept. 13, 1889	2.62	2.22	1.94	.69	1.05
♀	4590	C. F. Underwood	Bebedero	Feb. 15, 1890	2.56	2.25	1.95	.77	1.05
♀	4592	"	"	Feb. 22, 1890	2.59	2.26	1.90	.82	1.06
♂	1352	J. C. Zelédon	Pozo Azul	Jan., 1887	2.72	2.26	1.95	.80	1.13
		Average of the six females			2.61	2.19	1.86	.76	1.05
		Minimum			2.56	2.13	1.75	.69	1.03
		Maximum			2.68	2.26	1.95	.82	1.11

M. immaculata.

					Wing	Tail	Tail feathers	Exposed culmen	Nostril to tip of bill	Tarsus
♀	634	A. Alfaro	Jimenez	April, 1886	2.70	2.05	1.83	.75	.47	1.12
♀	3415	"	"	Aug. 8, 1889	2.62	1.96	1.70	.76	.49	1.10
♀	3416	"	"	Aug. 6, 1889	2.50	2.03	1.80	.70	.45	1.10
♀	3659	C. F. Underwood	Carrillo	Aug. 18, 1889	2.45	2.05	1.80	.74	.47	1.06
♀	4762	A. and C.	Jimenez	Dec. 22, 1889	2.64	2.17	1.84	.76	.45	1.02
♀	4763	A. and C.	"	Dec. 23, 1889	2.50	2.07	1.78	.73	.46	1.03
♂	1353	Juan Cooper	Pacuare	1876	2.60	2.15	1.80	.75	.49	1.07
♂	3418	A. Alfaro	Jimenez	Aug. 7, 1889	2.60	2.15	1.90	.65	.43	1.12
♂	3419	"	"	Aug. 16, 1889	2.66	2.08	1.85	.76	.47	1.12
♂	3420	"	"	Aug 22, 1889	2.58	2.16	1.88	.76	.49	1.13
♂	3421	"	"	Aug. 16, 1889	2.53	2.15	1.86	.71	.46	1.05
♂	3660	C F. Underwood	Carrillo	Aug. 18, 1889	2.67	2.04	1.76	.77	.48	1.05
		Average			2.59	2.09	1.82	.74	.47	1.08
		Average of six females			2.56	2.05	1.79	.74	.46	1.07
		Average of six males			2.60	2.12	1.84	.73	.47	1.09
		Minimum of females			2.45	1.96	1.70	.70	.45	1.02
		Maximum of females			2.70	2.17	1.84	.76	.49	1.10

The males of the eastern form are shown by these measurements to be larger than females from corresponding localities, but smaller than females of the western bird. The single male from the Pacific side is larger than any of the males from the Atlantic side.

BIRD WAVES AND THEIR GRAPHIC REPRESENTATION.

BY WITMER STONE.

In studying the migration of birds I have always recognized the need of some method of representing graphically the great combined movements or waves of the spring and fall and their coincidence with changes in temperature. It is hard to get any idea of this coincidence from consulting a mass of data unless one spends a considerable amount of time in studying it over, but in a graphic representation the whole matter can be seen at a glance.

The lack of exact data is a considerable hindrance to a satisfactory graphic representation, as the majority of the observers of migration have been content with noting the first and second arrivals and the so-called 'arrival of the bulk,' while the subsequent fluctuations in the number of individuals of the species have gone unrecorded. This year I have been fortunate enough to have at my disposal the observations recorded by the members of the Delaware Valley Ornithological Club on the spring migration of 1890 in the vicinity of Philadelphia. These records consisted mainly of the exact numbers of the various species seen from day to day at the several stations of the members of the Club. In some cases, however, after the early arrivals were recorded, such terms as 'common,' 'several,' etc., have been used to show the comparative numbers of the species present. This method is much less satisfactory, and but little easier to the observer, than noting the exact numbers seen or as close an estimate of them as possible. With this material I have been able to construct several charts which show quite satisfactorily the successive waves of the spring migration.

The method can best be understood by reference to the accompanying cuts. Across the top of the chart is a temperature curve showing the variation in the maximum daily temperature at Philadelphia. Beneath are recorded the daily observations on a few species of birds at five stations,—Haddonfield, N. J. (Saml. N. Rhoades); Wynnewood, Pa. (Wm. L. Baily); Tinicum, Pa. (J. Harris Reed); Olney, Pa. (Geo. S. Morris); and German-

town, Pa. (Witmer Stone). The numbers indicate the exact number of birds seen; 'F' denotes flocks; 'A,' abundant; 'C,' common; and 'S,' several. Wherever a record shows that a movement was taking place, either by the arrival of a species not seen on the days preceding or by the marked increase in the number of individuals of a species, the record is surrounded by a heavy line. The idea is, to show how these records are massed on certain days, indicating a bird wave on that day or the night just preceding, and also how these waves always occur at times when there is a marked rise in temperature.

In these small cuts, it is only possible to record the observations on a very few species, and I have been able only to show two or

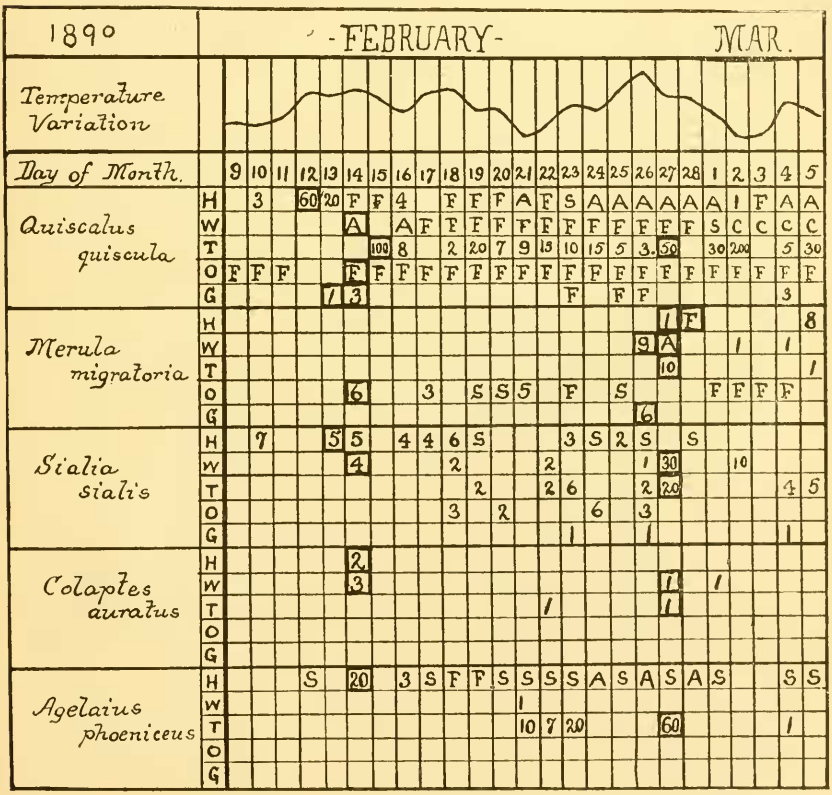


Chart showing the Second and Third Waves of 1890.

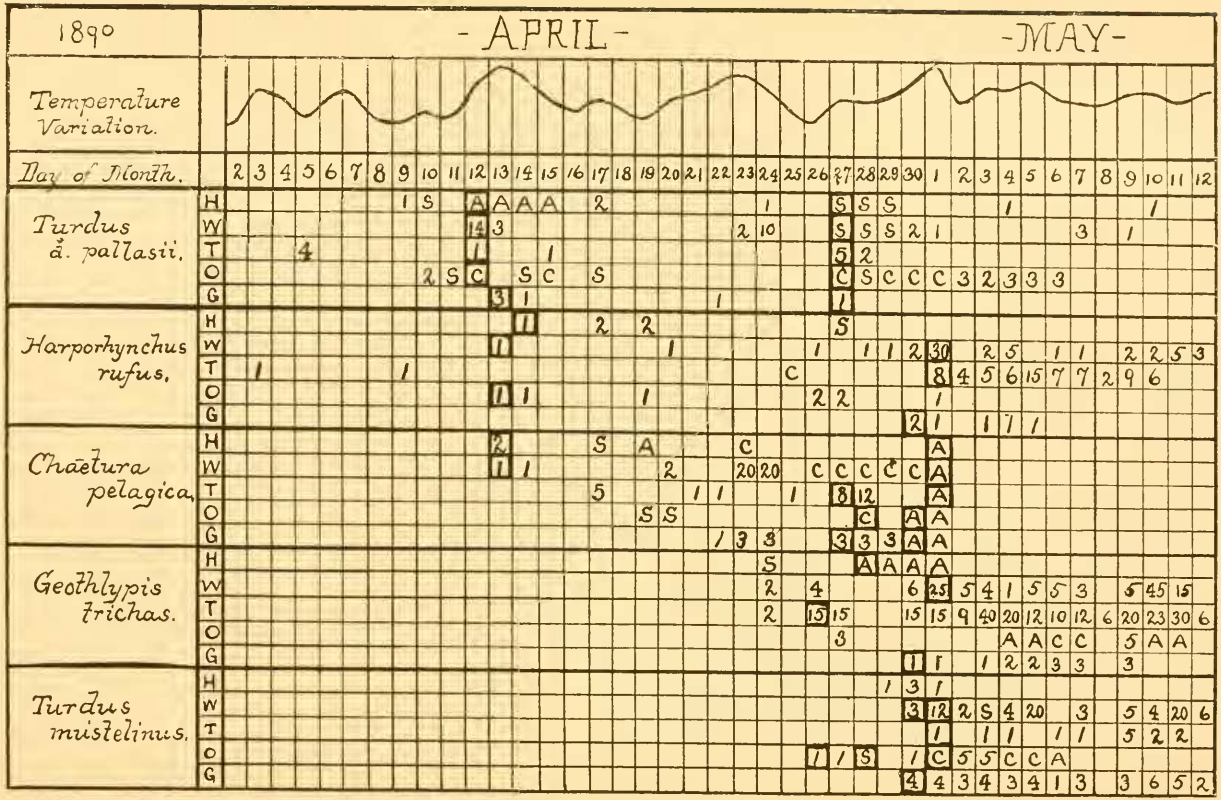


Chart showing the Fifth. Sixth and Seventh Waves of 1890

three waves distinctly in each. Therefore such records as indicate migratory movements at other times have not been marked with a heavy border, as it would only tend to make the whole appear confused, the function of these cuts being to illustrate the method rather than the results. A large chart giving the observations on twenty or thirty species shows a number of waves distinctly; each one corresponding to a rise in temperature. The most prominent waves of the spring with a few of their most characteristic species are as follows:

January 12.—Robin and Purple Grackle.
February 12-14.—Purple Grackle, Robin, Bluebird, Red-winged Blackbird, and Flicker.
February 26-27.—The same species.
March 12-13.—The same with the addition of Meadowlark and Cowbird.
April 12-14.—Song Sparrow, Chipping Sparrow, Savanna Sparrow, Hermit Thrush, Golden-crowned Kinglet, and Snow Bird.
April 26-27.—Maryland Yellowthroat, Brown Thrasher, Myrtle Warbler.
April 30—May 1.—Chimney Swift, Barn Swallow, Bank Swallow, Maryland Yellowthroat, Myrtle Warbler, Towhee, Wood Thrush, Baltimore Oriole, and numbers of Warblers.
May 4-5.—Mainly Warblers, also Towhee, Kingbird and Catbird.
May 10-11.—Warblers.
May 18.—Warblers.

As has been already stated two cuts, each based on only five species of birds fail to show all the waves, and do not give much idea of the amount of migration that occurred during the waves which they are intended to illustrate. The following summary, however, will show the amount of migration that took place on the days just given as characterized by the occurrence of bird waves, as compared with the other days of the spring. It must be remembered that we do not expect all the records of migratory movement to fall on the days of bird waves, as birds appear to migrate on every clear night after the spring is pretty well advanced; but we do expect a greater proportion of arrivals and increases in numbers to occur on these days than upon the other days of the spring, and this I think is clearly shown by the following: Taking into consideration the dates of first arrival of fifty of our more common migrants at the five stations already mentioned, between January 12 and May 12, we should have a total of 250 records. Of these twenty-five are lacking in the data before me, the birds having arrived after May 12 or having been missed altogether. These records fall as follows:—

Jan. 12.—First wave	3	
Jan. 13-Feb. 11		4
Feb. 12-14.—Second wave	4	
Feb. 15-25		6
Feb. 26-27.—Third wave	5	
Feb 28-March 11		0
March 12-13.—Fourth wave	6	
March 14-April 11		16
April 12-14.—Fifth wave	20	
April 15-25		12
April 26-27.—Sixth wave	16	
April 28-29		1
April 30–May 1.—Seventh wave	48	
May 2-3		8
May 4-5.—Eighth wave	28	
May 6-9		16
May 10-11.—Ninth wave	26	
May 12		3
	156	69

Summing up the result we find that on 19 days during which bird waves were in progress there were 156 first arrivals, or an average of 8.21 per day; while on 102 days when no waves were in progress there were but 69 arrivals, or an average of only .68.

It may be imagined that more careful observations were taken on the days upon which the waves appear to have occurred, but such was not the case, as the observers were aware of this possibility and guarded against it, endeavoring to spend a portion of every day in the field and to cover nearly the same ground daily.*

The increase in the numbers of individuals of each species seen daily, and the dates when the species became common, show a still greater coincidence with the dates which I have just mentioned as those of bird waves, than do the records of first arrivals just given. This is quite natural, so many of the latter are mere stragglers, and it is really surprising that so large a proportion of them as is shown by the summary do coincide with the waves.

In conclusion, I may say that this paper does not pretend to set forth any new theories in regard to bird migration, but simply to offer a few facts in corroboration of the already well-accepted wave theory; and to suggest a method for the graphic representation of the waves of migration and their coincidence with variations of temperature.

* See beyond, 'Work of the Delaware Valley Ornithological Club during 1890, under 'Correspondence,' in this number of 'The Auk.'

ON THE BREEDING HABITS OF *DENDROICA VIGORSII* AT RALEIGH, NORTH CAROLINA.

BY C. S. BRIMLEY.

THE PINE WARBLER—our commonest Warbler—during the breeding season frequents only pine woods and mixed woods containing pines as well as any isolated groups of pine trees; but at other times of the year it is not so exclusive, being often found as far from the neighborhood of pines as is possible in this locality.

This species feeds on insects and their larvæ, but like all our resident species consumes a large amount of vegetable food during the winter, *e. g.*, the seeds of the short-leaved and loblolly pines (*Pinus mitis* and *P. tæda*) as well as the berries of dogwood (*Cornus florida*) and sumac (*Rhus copallina*). During the spring and summer this species feeds mostly in the pine trees; during autumn and winter it also feeds on the ground to a great extent, and may then be found almost anywhere.

The Pine Warbler begins breeding quite early, the dates of finding the first nest (in each case about a day or two old) being March 27, 1888, March 27, 1889, March 3, 1890. The time occupied in building the nest and laying the four eggs is fourteen days, provided the weather is favorable; spells of bad weather such as cold rains or snow, or high and cold winds, usually cause building operations to be suspended for the time being, but this seems to vary with individual birds. In March, 1890, I had six nests under observation when a spell of bad weather came on; three were deserted; one furnished a fresh set in twenty-five days from first finding; one, a single fresh egg seventeen days from finding; and one, a set containing small embryos at the end of nineteen days; the latter nest must have been completed without interruption, although in quite an exposed situation. Nests in an advanced stage of construction do not seem to be often deserted; but when only just commenced, a bad spell of weather usually causes the birds to quit.

The female Pine Warbler gathers material from the trunks and limbs of trees and from the ground, and from both near the nest and as far as several hundred yards. She usually betrays her occupation by her business-like air and methods. She usually flies toward the nest in a straight, business-like flight, but as

a rule alights in the next tree before coming to the nest, or else in a tree beyond, and then hops down to the nest in a desultory sort of way, seldom going at once to the tree the nest is in. The female does most of the building, but on one occasion we observed the male assisting her. As a rule, however, he merely accompanies her in her journeys, keeping a little way off and singing assiduously his own individual song. The song of the Pine Warbler varies within certain limits, the usual song being very different from a nuptial song which is used only in the breeding season and by one fourth or less of the males.

The nest is always placed in a pine, the two species (*Pinus mitis* and *P. tæda*) being used about equally, but the situation varies a good deal. It may be on a horizontal limb, or built among the small twigs toward the end of a limb; in whichever position, it is put there to stay and takes a good deal of pulling to get it away. It may be close to the trunk or as far off as fifteen feet. The height too varies from twelve to eighty feet, the usual height being from thirty to fifty feet. The nest is solid and deep. It is constructed of weed stems, horsehair, and grapevine bark, and is thickly lined with horsehair and feathers. The dark-colored grapevine bark on the outside gives it an appearance characteristic of this species. A good deal of caterpillar silk also is used, as well as small cocoons, in its construction.

The eggs generally are four, sometimes three, and very rarely five. Four is the usual set for the second and third laying as well as for the first, while three seems usually to be the result of bad weather, as we have taken second sets of four from birds that had previously laid three. When one nest is taken, this species immediately builds another nest and lays another set, which I believe from my observations to be an almost universal trait among our small land birds.

The female incubates as a rule, but we have on several occasions found the male on the nest. When the eggs are taken the female usually tries the broken wing dodge. The majority of breeding females are in the dull plumage with little or no yellow below; a few, however, are bright yellow below and not much duller than the males, which renders it difficult in such cases to distinguish the sexes.

To conclude, I may state that the above observations are the result of watching the construction of over fifty nests of this species, thirty of which I found last year.

THE LABRADOR DUCK:—A REVISED LIST OF THE EXTANT SPECIMENS IN NORTH AMERICA, WITH SOME HISTORICAL NOTES.

BY WILLIAM DUTCHER.

THE OBJECT of this revised list is to bring before the ornithologists of North America the great desirability of search among the private collections of mounted birds, scattered throughout this country, for specimens of this species of Duck, which in all probability is now nearly, if not altogether extinct. A further object is to record the exact history of the extant specimens so far as it can be gathered at this late day. There are but few naturalists or sportsmen now living who have had any experience with the Labrador Duck in life, and these are one by one passing away. Of the life history of this interesting species but little is known, for when it was common there were but few, if any, observers in the field, and the science of ornithology had not advanced to its present high plane. As long ago as when Audubon was in Labrador (see his 'Birds of America') it was so rare that he did not meet with it and the great Wilson said of it: "This is rather a scarce species on our coast."* Giraud, in his 'Birds of Long Island,' says: "With us it is rather rare."

It is true that at a later date than the above, say during the period from 1840 to 1860, there were apparently more of these Ducks seen than earlier.†

This, however, I think, may be easily explained as follows: during the later period there were a far greater number of scientific collectors, and there was a market demand for game and waterfowl which gave employment to professional gunners who shot and sent to market great numbers of birds. During the open season one can see hanging in our markets hundreds and sometimes thousands of Ducks of the commoner varieties; this has been the case for many years, perhaps to a lesser degree formerly because the demand was not then so great. While it is very

* American Ornithology, Vol. III, 1829, p. 369.

† See the letters and statements given below of such ornithologists as George N. Lawrence, D. G. Elliot, John G. Bell and others who were actively collecting at that date.

probable that the Labrador Duck was more numerous at the time when Wilson and Audubon wrote of it, than during the subsequent period when it *appeared* to be more plenty, yet, I think my explanation of their apparent increase is the true one, and, even at the date when they were seemingly becoming more numerous, they were on the verge of their disappearance, for during the period from 1860 to 1870, when an active lookout was kept for them, none could be obtained.

Through the courtesy of those whose reminiscences are herein recorded I am able to present something of the life history of *Camptolaimus labradorius*, and, through much painstaking research on the part of others, a comparatively full history of the known specimens. At this point I wish to express my thanks to all who have so kindly aided me in this compilation.

In case it proves true that the species is extinct, we can only hope that some further specimens may be discovered in out-of-the-way places and securely preserved in public collections. That some have been so secured during the past decade is well known, and it may be the good fortune of some student of ornithology to serve science in a like manner in the future. It seems very likely that so striking a bird as *C. labradorius* would be selected for preservation by sportsmen, and professional and amateur gunners, for ornamental purposes and as trophies of shooting excursions. Scattered along the eastern coast of North America, from the Capes of the Delaware northward, are thousands of preserved specimens of game birds, waders, and waterfowl, and also birds rare and curious to the owners; among these the search must be made. It is the practise of the compiler to examine all such collections that come under his notice and it has been his good fortune to discover, and in some cases to secure, very many interesting specimens as the result of this delving among the possessions of the curious.

The first published list of specimens of the Labrador Duck appeared in 1877, in Rowley's 'Miscellany.'* As this list forms the basis of my work it will be given in full hereafter. Mr. Charles B. Cory, in his 'Beautiful and Curious Birds,'† revised

*Ornithological Miscellany. Edited by George Dawson Rowley, M. A., F. L. S., F. Z. S. Part VI, London, January, 1877, pp. 205-223, with 6 pl.

†Beautiful and Curious Birds of the World. By Charles B. Cory, F. L. S., F. Z. S., etc., Boston, 1881, Part IV.

the list somewhat, but, as it will now be still further revised and added to, it is not thought necessary or advisable to repeat the Cory list.

No attempt has been made by the compiler to revise the list of specimens in Europe, which will be given exactly as published in the 'Miscellany'. It is thought best, however, in this connection to call the attention of British ornithologists to the statement made by the late Dr. John Latham, that "a pair in possession of Sir Joseph Banks came from Labrador."* In the 'Encyclopædia Britannica' it is stated that the Banks botanical collection went to the British Museum. In Mr. Rowley's list, he specifically states that the specimens in the British Museum were otherwise obtained. It is fair to assume, therefore, that there is, at least, one pair of these valuable birds in Europe that is still unrecorded in the publications of the present day.

"*List of Specimens.*†

"EUROPE.

	Sex.	*Number.*
"The British Museum	♂, ♀	2
♂ adult, presented to the Museum by the Hudson's Bay Company about the year 1835.		
♀ adult, purchased from Verreaux in 1863, with a miscellaneous lot of North American birds.		
"Liverpool Museum	♂, ♀, ♂ juv.	3
♂ adult, purchased from Mr. Gould, January 16th, 1833.		
♀ adult, presented by T. C. Eyton, Esq. (no date); purchased from Mr. Gould January 16th, 1833.		
♂. Though regarded by Lord Derby as a female, this would appear to be a young male; "for the throat and breast are assuming the white of the male."		
"Strickland Collection, Cambridge	♂	1
Obtained by Mr. H. E. Strickland, from his relation, Mr. Arthur Strickland, in 1850; in full plumage and good condition. Nothing more is known about it.		
"Col. Wedderburn's collection	♂	1
Shot by him in 1852, in Halifax Harbour. Sternum in Cambridge Museum.		
"Leyden Museum	♂, ♀	2
Were obtained in 1863. The name put to them is, Prince of Neuwied.		

*A General History of Birds, Vol. X, 1824, p. 318.

† From Rowley's Miscellany, pt. VI, 1877, pp. 221-223.

"Berlin Museum.....? 1
"Paris Muséum d'Histoire Naturelle.....♂ 1
Presented in 1810 by M. Hyde; feet somewhat decayed.

"AMERICA.

"PROFESSOR BAIRD'S LIST.

"American Museum, Central Park, New York....♂, ♂, ♂ juv., ♀ 4
♂ adult, from the Wied Collection, 'Labrador.'
♂ adult from Mr. Elliot's Collection, Long Island, N. Y.
♂ juv., " " " " " " "
♀ adult " " " " " " "
"Collection of Mr. George N. Lawrence.....♂, ♀, ♂ juv. 3
♂ adult, obtained about 1842. Long Island, N. Y.
♀ " " " " " " "
♂ juv., obtained about 1865.

"*Brooklyn, Long Island.*

"Long Island Historical Society.....♂ 1
♂ adult, 1842. Long Island, New York.
"Collection of Dr. Aiken.....♂ 1
♂ juv., obtained within a few years from Long Island, New York.
"Poughkeepsie, New York; Vassar College.....♂, ♀ 2
♂ adult, from Collection of Mr. J. P. Giraud, L. I.
♀ " " " " " " " "
"Albany, New York: State Collection.....♂ 1
♂ adult, Long Island, New York.
[*N. B.*—All the above were obtained on the south side (sea-shore) of Long Island, say about 1840-42, except when differently stated.]
"Collection of Mr. George A. Boardman, Calais, Maine....♂, ♀ 2
"Burlington (Vermont University).....♂, ♀ 2
♂ and ♀ adult; Long Island.
"Philadelphia: Academy of Natural Sciences.....♂, ♀ 2
"Washington: Smithsonian Institution.....♂, ♂, ♀ 3
♂ from Long Island.
♂ and ♀, from Mr. Audubon's Collection. Locality unknown.

"Collection of Mr. A. B. Covert.....? 1?
Ann Arbor, Mich.; *cf.* letter in 'Forest and Stream,' May 4th, 1876. Taken at Delhi Mill, Michigan, April 17th, 1872."

Total.....33

Collection of the American Museum of Natural History, New York City.

This collection of Labrador Ducks is by far the finest in the world, not only in point of numbers but in the quality and condition of the specimens. A portion of them have been recently remounted and formed into a group with characteristic surroundings, the whole forming an artistic and realistic object lesson. Three of the specimens in this collection came to the Museum with the collection of Mr. George N. Lawrence, which was acquired in 1887. Three of the others were once the property of Mr. D. G. Elliot, who informs me that he had them all in the flesh. The adult male he secured through John Akhurst, an old and very well known and highly respected taxidermist of Brooklyn; his adult female and young male he procured of the late John G. Bell, a New York City taxidermist of world-wide reputation. The National Museum collection was enriched some years since (1872) by the addition of an adult male from the collection of the American Museum, which was also a part of the Elliot collection. Mr. Elliot states that one of these adult male birds was the last one taken in the vicinity of New York, and, as far as known, the last adult male ever taken.

♂ adult, No. 3739, from the Wied collection, Labrador.

♂ adult, No. 3738, from Mr. Elliot's collection, Long Island, N. Y., about 1862.

♂ juv. No. 3741, from Mr. Elliot's collection, Long Island, N. Y.

♀ adult, No. 3740, from Mr. Elliot's collection, Long Island, N. Y.

♂ adult, No. 45803, from George N. Lawrence's collection, Long Island, N. Y., obtained about 1842.

♀ adult, No. 45801, from George N. Lawrence's collection, Long Island, N. Y., obtained about 1842.

♂ juv., No. 45802, from George N. Lawrence's collection, Long Island, N. Y., obtained about 1865.

Mr. Lawrence informs me that he obtained his two adult birds from J. G. Bell, and the immature bird he purchased in Fulton Market, New York City.

Collection of the Long Island Historical Society, Brooklyn, New York.

♂ *adult.* "The specimen of the Labrador Duck presented by me to the Long Island Historical Society, was one of two specimens, both male birds, that I killed in November, 1844, at the

mouth of the Ipswich River, south end of Plum Island, Massachusetts Bay. I was paddling in my float or sneak boat, covered with salt hay, when I saw three of these birds, two males and a female, feeding on a shoal spot near a sand-spit. I shot the males, but the female escaped then. I killed her, however, later in the day, on the same spot. A male and female were given to John Bell, then a taxidermist, on Broadway, New York, and John Akhurst mounted the fine male I gave the Historical Society." —NICOLAS PIKE.

Collection of Mr. Gordon Plummer, Boston, Mass.

♂ *juv.* "October, 1890. I sold my Labrador Duck about one month since to Mr. Gordon Plummer, of Boston, Mass."—HENRY F. ATEN, M. D.

"I have in my collection one specimen of the Labrador Duck, young ♂. The only data I have are from Dr. Aten. He procured it of John Bell, who mounted it, some fifteen or twenty years since. Bell had it in his possession some years before Dr. Aten got it. It was found in Fulton Market, New York City, by Bell, who secured two at that time, and Dr. Aten thinks Bell found it among a lot of Old Squaws which came from Long Island, N. Y. My specimen is in excellent condition and acquiring full plumage, I should judge." — GORDON PLUMMER.*

Collection of Vassar College, Poughkeepsie, N. Y.

♂ *adult*, from the collection of J. P. Giraud, Jr. This specimen is a finely mounted, full plumaged, male bird. That it is from Long Island, as stated in the Rowley List, there is absolutely no proof, although it is highly probable, as the greater portion of Mr Giraud's life-long ornithological work was done on Long Island. The compiler visited the Vassar collection and through the courtesy and with the aid of Prof. William B. Dwight, examined the whole Girand collection and all the manuscript and lists connected with it, but could find no data concerning the specimen of the Labrador Duck. Professor Dwight subsequently visited Mrs. Giraud, the widow of the donor of the collection, who willingly placed at his disposal all the ornithological papers in her possession that were left at the death of her husband. Unfortunately nothing was found that threw any light on the subject.

*This is the "Dr. Aiken" specimen in the Rowley List.

In the Rowley List the Vassar collection is also credited with the possession of an adult female Labrador Duck. This is unfortunately not a fact. There is no evidence of any kind indicating that there ever was but one Labrador Duck in the Giraud collection.

Correspondence by Prof. Dwight with Mrs. Tenney, the widow of Professor Sanborn Tenney, his predecessor in charge of the Vassar collection, elicited only the statement that "it is out of the question to suppose that Prof. Tenney could ever have exchanged so valuable a bird as the Labrador Duck from the collection." Prof. Dwight concludes with the following note: "I seem, therefore, to have exhausted all known sources of personal or documentary information. So as it stands, our official list, clearly made out, credits the College with only one specimen, the male. The Rowley List credits the College with two specimens. In the absence of corroborative evidence for the Rowley List, and of only the fact that one specimen alone now exists in the collection, the presumption is entirely in favor of a clerical error in the Rowley List, or of an error on the part of the informant. It is certain that Vassar College is not given to 'exchanges,' certainly not of its valuable birds which were given by Giraud to remain as far as possible a *complete* representation. We have had offers of purchase or exchange at high prices, but have uniformly and immediately declined."

Collection of the University of the State of New York, New York State Museum, Albany.

♂ *adult.* "The male Labrador Duck (Pied Duck) listed on page 38 of the Catalogue of the De Rham Collection (4th Ann. Report) is still in our collection, but we have no data concerning it. For information concerning the De Rham collection I refer you to the 3d and 4th Annual Reports of the State Cabinet."

♀ *adult.* "The other specimen of Labrador Duck in our collection is a female, and after a careful search into its history I have come to the conclusion that it was in the State Cabinet when De Kay prepared his report on Birds.* Our Annual Reports record but two Labrador Ducks, viz., the male in the De Rham collection, and one specimen (sex not stated) catalogued in the 1st

*Zoology of New York. Part 2, Birds. By James E. De Kay. Albany, 1844, p. 326.

Ann. Rept., p. 20, 1848. I think this latter specimen must be the female alluded to above, and as it was in the collection in 1848, only five years after the publication of De Kay's Birds, I think he must have referred to this specimen when he quoted the State Collection (Birds, p. 326)."—WILLIAM B. MARSHALL, *Ass't Zoologist.*

Collection of Mr. Charles B. Cory, Boston, Mass.

♂ *adult* and ♀ *adult.* "I have only two in my private collection, an adult ♂ and ♀, in full plumage. They were killed somewhere between 1857 and '60, and were in George A. Boardman's collection, and were sold to me, by him, some ten years since."—C. B. CORY.

"I sold my Labrador Ducks to Mr. C. B. Cory. They were shot at Grand Manan a good many years ago, when they were not considered very rare or of much importance. I think they were sent to me by Mr. Isaac Newton, in the spring."—GEORGE A. BOARDMAN.

Collection of the University of Vermont, Burlington, Vermont.

♂ *adult.*—In the Rowley List this collection is credited with two specimens, both from Long Island. Mr. G. H. Perkins, Professor of Natural History in the Vermont University, has furnished the following information regarding the specimens of this species in their collection: "The Museum of the University has not a pair of Labrador Ducks, but only the male, a very fine and well mounted specimen. It came in a collection made by a gentleman in New York, through Prof. S. F. Baird. I have searched all the documents in existence concerning the Labrador Duck and what I find is a Smithsonian Check List headed by a note in Professor Baird's handwriting: 'A List of Birds in collection of Ed. Dunham, purchased for University of Vermont.' On this list the species are checked and sex and age noted. The 'male adult' is the only note against the Labrador Duck, and I think this was all that was included in the list and the only specimen we ever had. How we were credited with a pair I do not understand. Professor Baird told me once that most of our birds were collected on Long Island, but where this particular species was taken I do not know. In general I understand that all ducks in this collection, not otherwise named, are from Long Island."

Subsequently the compiler called the attention of Mr. George N. Lawrence to the above statement, with a view of ascertaining the identity of Mr. Dunham, the original owner of the collection. Fortunately Mr. Lawrence was able to furnish the desired information, which is as follows: "The specimen in the Vermont University is undoubtedly that of the Philip Brasher collection, which they have entire. Professor Baird asked me about the collection that was bought from Mr. Dunham and queried whether it was the one originally owned by Mr. Brasher. I enquired of Mr. John Akhurst of Brooklyn, and learned from him that Mr. Brasher did not want it known that he had parted with his collection and for that reason sold it under another name. He assisted in packing it at Mr. Brasher's house and knew it went from there to the Burlington College." Mr. Brasher was a resident of Brooklyn, an intimate friend of Mr. Giraud, who in the introduction to his 'Birds of Long Island' takes occasion to say that he had made use of the valuable cabinet of Mr. Brasher in the preparation of his work. It is therefore safe to assume almost positively that the location designated for this specimen is correct.

Collection of the Academy of Natural Sciences, Philadelphia, Pa.

"I have looked carefully through the collection and find three specimens, all mounted. Nearly all the specimens in the Academy collection are mounted, and were obtained a long while since, and have very few data attached to them. From several years' work among them, however, I can generally tell from the character of the labels, stands, etc., where the specimens were obtained.

♂ *juv.* "A young male, with a white throat, but with very slight indications of white on the breast, was procured by Dr. Thomas B. Wilson, through Verreaux, and was probably included in the collection of the Duc de Rivoli. This bird was presented to the Academy by Dr. Wilson with the rest of his collection. It bears a small label attached to the leg—'Anas——. Amer. Sept.'—but no other data except a number on the stand, which does not correspond to any catalogue that we have.

♂ *juv.* "Another young male with more indications of white on the breast than the one just described.

♀. "These last two specimens are probably those referred to in the Rowley List. They are mounted in the same manner, on the same kind of stands, and were, I think, in all probability procured at the same time. From the character of the mounting I should think they were procured somewhere in this neighborhood, *i. e.*, Pennsylvania or New Jersey, most likely by Krider or Cassin, somewhere in the 'fifties,' but unfortunately they bear no data whatever, and I have not been able to find a record of their presentation. My suggestions as to the locality and date of collection are based on comparison with other specimens similarly prepared and which bear data."—WITMER STONE.

Collection of the United States National Museum, under direction of the Smithsonian Institution, Washington, D. C.

"I send you herewith a list of specimens of the Labrador Duck in our collection:

♂ adult—No. 1972, 'North Atlantic'; J. J. Audubon.
♀ adult—No. 2733, 'North Atlantic'; J. J. Audubon.
♂ adult—No. 61,300, 'North Atlantic'; Am. Mus. Nat. Hist., New York City.
♂ juv.—No. 77,126, Long Island, N. Y., Fall 1875. J. G. Bell.

"The first specimen of the Labrador Duck which actually came into the possession of the 'Smithsonian Museum' was obtained in January, 1872, from the American Museum of Natural History, New York City. It is true there were two specimens (male and female), inside the Smithsonian building before January, 1872, but they belonged to Professor Baird's private collection, which he considered his personal property while he lived. They are the pair figured and described by Audubon, and given by him to Professor Baird."—ROBERT RIDGWAY, *Curator, Dep't of Birds.*

It will be of interest in this connection to quote from Audubon:* "The Honorable Daniel Webster, of Boston, sent me a fine pair killed by himself, on the Vineyard Islands, on the coast of Massachusetts, from which I made the drawing for the plate before you."

Collection of Mr. William Brewster, Cambridge, Mass.

♀. "My female Labrador Duck is apparently an adult bird, and is in good plumage and condition. The skin came to me

*The Birds of America, Vol. V, 1842, p. 329.

bearing a label on which is inscribed simply 'Nova Scotia, 1857.' I bought the bird in April, 1878, of Mr. Bernard A. Hoopes, of Philadelphia, Pa., who informed me that he obtained it from William P. Trumbull, who in turn had it from 'a taxidermist in New York City.' This is all I have ever been able to find out about the specimen.—WM. BREWSTER."

♂ *juv.* "I purchased my second Labrador Duck from Dr. Thomas B. Heimstreet of Troy, New York, who bought it, with some other skins, at the sale of a collection made by Mr. George B. Warren of Troy. The skin bore no label whatever and I have been unable to find out anything about its origin, although I wrote to both of Mr. Warren's sons. The bird is evidently a young male, for the black markings of the adult can be traced in portions of the plumage, which, as a whole, is not unlike that of the female."—WM. BREWSTER.

Mr. Austin F. Park, an ornithologist of Troy, New York, who had seen and examined the above specimen, informed me that it "was a well-made skin, apparently of an immature male, and from the similarity of its make-up to that of several duck skins that were in the same collection, and that were labeled as from a taxidermist or dealer in the City of Quebec, Canada, I suspect that perhaps the skin may have been obtained from that place."

Dr. Heimstreet has furnished the following additional information as to how the specimen in question came into his possession, and also of its original owner, Mr. Warren. "The Labrador Duck which I sold to Mr. William Brewster in November, 1887, was from the collection of the late George B. Warren, who was one of the oldest residents and business men of Troy, where he was born, and where he died May 8, 1879, in his eighty-second year. Mr. Warren studied and collected birds as an amateur upwards of forty years, and had occasionally received ornithological visits from Audubon and Baird. At his death he left to his widow a few hundred nicely mounted specimens of birds, and many hundred bird-skins, embracing some of the very rare birds of America. In 1879 the widow presented most of the mounted birds to the Rensselaer Polytechnic Institute of Troy, and disposed of a large portion of the skins to H. N. Camp, of this city, and myself. We divided the same between us, and I did not discover that I had the Labrador Duck in my share of the skins for many months."

Collection of the Boston Society of Natural History, Boston, Mass.

♂ *juv.* "In the above collection, which is under my charge, we have an immature male Labrador Duck. It was donated to the Society years ago by Theodore Lyman. No date or locality; supposed to have been taken on the coast of New England."—CHARLES B. CORY.

"The Boston Society specimen is a young male, very much like my Troy specimen."—WILLIAM BREWSTER.

Collection of Dalhousie College, Halifax, Nova Scotia.

♂ and ♀. "The only specimens I know of in Nova Scotia are a pair (male and female) in the possession of Dalhousie College, in our City. They were originally owned by Rev. Dr. MacCulloch, of Picton, Nova Scotia. He was somewhat of a naturalist and a friend and contemporary of Audubon, who frequently mentions his name in his work. Dr. MacCulloch made a collection of birds and willed them to Dalhousie College; they were in very bad order, and the only specimens of any value were the pair of Labrador Ducks which have been remounted." —THOMAS I. EGAN.

The following excerpts from a paper read before the Nova Scotian Institute of Natural Science, May 10, 1886, by Mr. Andrew Downs, refers to the specimens in the Dalhousie College Collection:* "Dalhousie College Museum contains a very rare pair of birds which have now become extinct, the Pied, or Labrador Duck. Attached to them is this label—'Family, Anatina, Brisson; genus, Fuligula; Fuligula Labradora, Lath. Pied Duck. Male and Female. Very Rare.' I think the Dalhousie Museum very fortunate in possessing a male and female of this rare duck. I have been a close observer of the birds of this Province for 63 years, and I have never seen this bird in the flesh, other than a specimen given me by William Winton of Halifax, who obtained the specimen, a male, in the market."

Mr. Harry Piers, of Willow Park, Halifax, under date of November 1, 1890, informs me: "I was talking with Mr. Downs, the other day, and his views are still the same as expressed in his

* Transactions of the Nova Scotian Institute of Natural Science, Vol. VI, pp. 326-327.

article. He knows of no other specimens in public or private collections in Nova Scotia."

REVISED LIST OF SPECIMENS IN NORTH AMERICA.

Collection of the American Museum of Natural History, N. Y.	Adult ♂	3
	" ♀	2
	Juv. ♂	2
Collection of the Long Island Historical Society, Brooklyn, N. Y.	Adult ♂	1
Collection of Vassar College, Poughkeepsie, N. Y.	" ♂	1
Collection of the University of the State of New York, Albany, N. Y.	" ♂	1
	" ♀	1
Total in New York State		11
Collection of William Brewster, Cambridge, Mass.	" ♀	1
	Juv. ♂	1
Collection of Charles B. Cory, Boston, Mass.	Adult ♂	1
	" ♀	1
Collection of Gordon Plummer, Boston, Mass.	Juv. ♂	1
Collection of Boston Society of Natural History, Boston, Mass.	" ♂	1
Total in Massachusetts		6
Collection of United States National Museum, Washington, D. C.	Adult ♂	2
	" ♀	1
	Juv. ♂	1
Total in Washington		4
Collection of the Academy of Natural Sciences, Philadelphia, Pa.	♀	1
	Juv. ♂	2
Total in Pennsylvania		3

Collection of the University of Vermont, Burlington, Vt.	Adult	♂	1
Collection of Dalhousie College, Halifax, N. S.	"	♂	1
	"	♀	1
Total in Canada			2
Total known in North America . . .			27
Total known in Europe			11
Total known			38

The Covert specimen, mentioned in the Rowley List, is not included in the above Revised List, as there are very good reasons for doubting its validity.

Specimens Recorded and since Lost.

"William Winton, of Halifax, obtained a male in the market. He gave his specimen to me; I gave it to George A. Boardman." —Andrew Downs.*

"I obtained an old skin from Mr. Downs of Halifax but it was so eaten by mice and moths that it was destroyed."—George A. Boardman.

"I received a ♀ from Mr. Cheney, that had been shot in April, 1871.—Harold Herrick.†

"The last one I know to have been taken was shot by S. F. Cheney, at Grand Manan, in April, 1871. It was given to Harold Herrick, who subsequently gave me the skin. I sent it to John Wallace, of New York to be mounted for Prof. S. F. Baird of the Smithsonian Institution. Not knowing its value, Wallace let some one get the skin from him and it was thus lost to the Smithsonian, as he could not tell who had it."—George A. Boardman.

"The female Labrador Duck I gave to Mr. Herrick was with some Old Squaws or Long-tailed Ducks when I shot it, and I think there were no others of the kind with it. This one had

*Trans. of the Nova Scotian Inst. of Nat. Sci., Vol. VI, p. 327.

†A Partial Catalogue of the Birds of Grand Manan, New Brunswick. Bull. Essex Inst., Vol. V, Nos. 2 and 3, 1873.

Small shells in its crop. It dove to the bottom with the Squaws." —S. F. CHENEY, *Grand Manan, N. B.*, October 30, 1890.

"There was a nice pair in Barnum's old Museum, in New York City, that were destroyed by fire. I used to see them after they became rare and tried to get them for the Smithsonian Institution, but did not succeed."—GEORGE A. BOARDMAN.

The specimen recorded by Dr. W. H. Gregg, of Elmira, New York* has unfortunately been lost. Dr. Gregg informs me that the duck in question was shot by a lad December 12, 1878. It was found in a broad expanse of lowlands called the Buttonwoods. These had been overflowed by the Chemung River, during a freshet. The duck had been eaten before he heard of its capture: never saw or was able to procure anything but the head and a portion of the neck. These were preserved for some years. Recently while moving his collection to New York City he entrusted the packing of his specimens to another person, and as the head cannot now be found he suspects that it was thrown away with some moth infested birds as of no interest or value.

HISTORICAL NOTES.

"I recollect that about forty or more years ago it was not unusual to see them in Fulton Market, and without doubt killed on Long Island; at one time I remember seeing six fine males, which hung in the market until spoiled for the want of a purchaser; they were not considered desirable for the table, and collectors had a sufficient number, at that time a pair being considered enough to represent a species in a collection. No one anticipated that they might become extinct, and if they have, the cause thereof is a problem most desirable to solve, as it was surely not through man's agency, as in the case of the Great Auk."—GEORGE N. LAWRENCE, *New York City*, January 4, 1891.

"I believe this Duck is now extinct. My business is dealing in game, and I see many of the fishing people from Newfoundland: I believe if any odd birds were seen that I would hear about them. The name 'Pied Duck' is now applied to the Surf Scoter by many of the gunners from Labrador and Newfoundland."—THOMAS I. EGAN, *Halifax, N. S.*, Nov. 17, 1890.

"I have in my life shot a number of these beautiful birds,

*American Naturalist, Vol. XIII, p. 128, February, 1879.

though I have never met more than two or three at a time, and mostly single birds. The whole number I ever shot would not exceed a dozen, for they were never plentiful: I rarely met with them. The males in full plumage were exceedingly rare; I think I never met with more than three or four of these; the rest were young males and females. They were shy and hard to approach, taking flight from the water at the least alarm, flying very rapidly. Their familiar haunts were the sandbars where the water was shoal enough for them to pursue their favorite food, small shellfish. I have only once met with this duck south of Massachusetts Bay. In 1858, one solitary male came to my battery in Great South Bay, Long Island, near Quogue, and settled among my stools. I had a fair chance to hit him, but in my excitement to procure it, I missed it. This bird seems to have disappeared, for an old comrade, who has hunted in the same bay over 60 years, tells me he has not met with one for a long time. I am under the impression the males do not get their full plumage in the second year. I would here remark, this duck has never been esteemed for the table, from its strong, unsavory flesh."—NICOLAS PIKE, *Brooklyn, New York*, January 4, 1891.

"I began to collect birds about fifty years ago and wanted to get a pair of each species; I did not care for more. The Labrador Duck I procured without much trouble, and if I had any duplicates sent to me I did not save them any more than I should have saved duplicates of Scoters, or Old Squaws. I have no doubt but that I may have had others. I had shooters all about the coast of Grand Manan and Bay of Fundy sending me anything new or odd. Anything they sent to me that I already had mounted generally went into the manure heap. About twenty years since Messrs. John G. Bell and D. G. Elliot of New York wrote to me to try and get them some Labrador Ducks. I wrote to all my collectors, but the ducks had all gone. It seems very strange that such a bird should become extinct, as it was a good flier."—GEORGE A. BOARDMAN, *Calais, Maine*, October 16-29, 1890.

DESCRIPTION OF A NEW SPECIES OF *MIMOCICHLA*, FROM THE ISLAND OF DOMINICA, WEST INDIES.

BY J. A. ALLEN.

Through the kindness of Professor A. E. Verrill, of Yale College, New Haven, I have had recently an opportunity to examine a very complete collection of the land birds of the Island of Dominica, West Indies, made by Professor Verrill's sons, Messrs. Alpheus H. and George E. Verrill, who collected in Dominica for several months during 1890.

Among the rarities of the collection are two specimens of a *Mimocichla*, new to science, and forming the first specimens of the genus known from the Lesser Antilles.

Mimocichla verrillorum, sp. nov.

Thrush? LAWRENCE, Proc. U. S. Nat. Mus. I, 1878, p. 53.

Similar to *M. ardosciacea* of San Domingo and Porto Rico, but much smaller, with much more white on the tail, and with the abdomen strong buff instead of plumbeous fading into white.

Adult male. (Collector's No. 102, Lasswa, Dominica, April 11, 1890; G. E. and A. H. Verrill.)—Above general color nearly uniform dark slate-gray, the feathers of the head with slightly darker centres; lores black; wings black, the coverts and all of the quills broadly edged with slate-gray, lighter than the color of the back, especially on the greater coverts and primaries; tail black, the basal half of the middle feathers externally edged with gray, and all broadly tipped with white except the middle pair, which shows only a faint trace of white at the extreme tip; the outer feather on each side has the inner vane white for more than half its length, the amount of white regularly diminishing on the inner pairs to the fifth, on which it forms a central triangular patch at the end about half an inch in length. Chin, cheeks and throat white, broadly streaked with black; breast and flanks slate gray, much lighter than the back; abdomen white, strongly washed with buff; crissum pure white. Bill and feet bright yellow.

Length (from skin) about 10.50 in.; wing, 4.60; tail, 4.50; culmen, .85; tarsus, 1.50.

Adult female. (Collector's No. 103, Lasswa, Dominica, April 11, 1890.)—Slightly smaller than the male, with the breast paler, and the abdomen more deeply tinted with yellowish buff.

This species finds its nearest relative in *Mimocichla ardosciacea* of Porto Rico and Santo Domingo, holding somewhat the same relation to it, as regards the color of the ventral surface that *M. rubripes* holds to *M. plumbea*. The wing and tail are each fully three-fourths of an inch shorter in *M. verrillorum* than in *M. ardosciacea*: the culmen is also shorter; but the tarsi are slightly longer and the wing appreciably more rounded. The white in the tail is much purer, and twice greater in extent, tipping the outer five pairs of feathers instead of being confined to the outer four, as in the other species of the genus, and occupying considerably more than the apical half of the outer feather.

This is evidently the bird mentioned by Mr. Ober as "described [to him] by several persons, something like a Thrush, but with yellow bill and legs," and enumerated by Mr. Lawrence* as "5. 'Thrush'?" According to the Messrs. Verrill, the bird is well known to the natives of the island, who call it *Perro vanter*; they, however, esteem it very rare and extremely difficult to get.

SOME BIRD SKELETONS FROM GUADALUPE ISLAND.†

BY FREDERIC A. LUCAS.

By the kindness of Dr. C. Hart Merriam I some time ago came into the possession of several bird skeletons collected at Guadalupe Island, off the coast of Lower California, by Mr. Walter E. Bryant. Guadalupe Island is of peculiar interest from the fact that it seems to have been separated from the mainland only long enough for its fauna to have taken the first steps toward differentiation, the number of peculiar species being very small, and the number even of sub-species limited. In this respect Guadalupe differs vastly from the Galapagos Islands, where specific differentiation has proceeeded so far that each island has its own char-

* Catalogue of the Birds of Dominica from Collections made for the Smithsonian Institution by Frederic A. Ober, together with his Notes and Observations. By George N. Lawrence. Proc. U. S. Nat. Mus., I, 1878, pp. 48-69.

†Read at the Washington meeting of the A. O. U., Nov., 1890.

acteristic species, while many of them are separated by a wide gap from their nearest relatives of the mainland, and we may say that in the Galapagos we see differentiation in its completion, and in Guadalupe in its inception.

The value of these skeletons lies in the fact that they give us some hints as to the comparative rapidity with which external and internal changes may take place, and it is much to be regretted that we possess no good series of skeletons of species common to the island and the continent.

As the climatic conditions existing at Guadalupe are not very different from those prevailing on the mainland, color differences between subspecies, or even closely allied species, would be largely the result of any innate tendency to variation, while structural differences would be due either to the same cause, or to change of habit produced by restricting the range of individuals to a limited area. Now while a considerable amount of individual variation will be found to exist in any extensive series of specimens of a given species, such differences, aside from those of mere size, are, as a rule, either reversionary in character or due to physiological adaptation, the existing groups of birds, and especially the Passeres, seeming to have become so fixed in their respective types that new morphological departures are extremely rare. It would, therefore, have been very strange had any such departure been found to exist in the five species represented, and it is very evident that the skeletal peculiarities presented by the skeletons under consideration are the result of change of habit due to insulation.

In order to express the relative proportions of the limbs and sternum and show the amount of their variation in the birds considered, the length of the vertebral column, exclusive of the caudals, was called one hundred, and the various parts compared with this standard.

The skeletal differences between *Polyborus tharus* and *P. lutosus*, the first on the list, are extremely slight, so slight indeed, that judged by them alone there are no grounds for considering the two birds as belonging to two species. That there are no perceptible distinctions between the skeletons of the two species, is not, however, surprising, for *Polyborus tharus* being nonmigratory, the habits of the two birds must be very much alike and there would be no physiological reason for any change,

while change from any inherent tendency of a species to vary seems to come about very slowly and require a vast stretch of time for its accomplishment.

Comparison of *Pipilo consobrinus* with *Pipilo maculatus megalonyx* and *P. erythrophthalmus* shows a considerable falling off of the island bird in the length of the sternum, for while the legs and wings of all three species are practically alike the sternum of *consobrinus* is but little more than two thirds as long as that of *erythrophthalmus*. *Pipilo erythrophthalmus* is much the strongest of the three species in its wing, for although the wing itself is but a trifle longer than in the others the sternum is not only longer, but deeper than in either *consobrinus* or *megalonyx*, indicating well developed pectoral muscles. As all the Chewinks spend much of their time upon the ground, similarity of habit in this respect would naturally account for similarity in the size of the leg. The migrations of *Pipilo maculatus megalonyx*, are short, this southwestern species inhabiting the mountains in summer and descending to the valleys for the winter. The migrations of *Pipilo erythrophthalmus* on the other hand are extensive, and its greater sternal development is simply a result of the greater length of its travels, while the restriction of *Pipilo consobrinus* to one locality, coupled with its ground-loving habits, has brought about the diminution of its flying apparatus.

Junco insularis, when compared with *J. hyemalis*, not only shows great sternal reduction, but reduction in the length of the wing, although the humeri of the two species are much alike.

The case of these birds parallels that of the Pipilos, *Junco hyemalis* being a bird of extensive range and consequently good powers of flight, while *insularis* is of restricted range and equally restricted flight.

Carpodacus amplus is well named, for it is a stout, well-rounded bird, slightly larger than *Carpodacus cassini*, and almost twice the bulk of its nearer relative *Carpodacus frontalis*.

Comparison shows that *C. amplus* is ahead of both these in length of leg, and that it leads *C. frontalis* in length of wing, although showing some falling off in the length of the sternum.

All in all the island bird seems to have undergone but little change from its restricted habitat, and if it has lost in wing power, this has been compensated for by increase in the length of leg and size of skull, this exceeding that of *C. cassini*.

There seems to be an increase in the size of the skull indicated by these specimens, for in this particular *Junco insularis* exceeds *J. hyemalis* and *Polyborus lutosus*, *P. tharus*.

The last bird to be considered is *Salpinctes guadalupensis*, and this species is remarkable from the fact that it has gained and not lost in power of flight, for its wing decidedly exceeds that of *S. obsoletus*, while the sternum of the island bird is a little more than one half longer than that of the continental form. Why this little Guadalupe Wren should have developed such powerful wings, comparatively speaking, is not perhaps quite clear, but it may be possible that in these Guadalupe birds we have a case paralleling that of the insects of the Azores, which either fly well, or do not fly at all, the inference being that all insects of but moderate powers of flight have been swept out to sea and lost. Be that as it may, *Salpinctes*, and to some extent *Carpodacus amplus*, indicates that insulation is not of necessity degeneration so far as the power of flight is concerned.

There are two interesting facts that Mr. Bryant has recorded in regard to *Salpinctes guadalupensis*, the first being that measurements show a slight increase in the length of bill during an interval of ten years, while in the same space of time the species had become the most abundant on the island, *Junco insularis* having previously taken the lead in that respect.

Now there may be no correlation between the power of flight and increase in numbers, but is it not probable that superior wing power would give superior ability to obtain food, to elude the pursuit of enemies and to escape being blown out to sea while superiority in these points would not unnaturally lead to an increase in the number of individuals?

There are certain facts well illustrated by the proportionate measurements for these birds, and although these facts are doubtless well known I do not remember to have seen them formally stated. They are as follows:

The first symptom of weakening flight appears in a decrease in the length of the sternum, diminution in the depth of the keel not taking place until later on.

This is followed by reduction in the length of the wing, beginning with the manus and fore arm, the humerus apparently not being affected until the rest of the wing is perceptibly lessened. Then the outer wing bones disappear, leaving only the humerus

—as in *Hesperornis*,—and finally the humerus itself may be wanting, as in *Dinornis giganteus*, and we have the extreme of degeneration in an absolutely wingless bird.

MEASUREMENTS.

	Leg.	Wing.	Humerus.	Sternum. Length.	Sternum. Depth.
Pipilo consobrinus	122	90—	30—	23+	9
" maculatus	120	90	30	30	9
" erythrophthalmus	122	91	30	33	11
Junco insularis	112	88	29	22	8
" hyemalis	113	97	30	30	10
Carpodacus amplus	100	99	29—	34	12
" cassini	99	101	29	36	12
" frontalis	94	96	28	36	12
Salpinctes guadalupensis	120	99	30—	35+	6.5
" obsoletus	121	85	28	22	6

RECENT LITERATURE.

The Ornithology of 'The Century Dictionary.'*—'The Century Dictionary' is beyond doubt *the* literary monument of the age. It is the result of seven years of arduous and unremitted work on the part of some forty experts, consisting of eminent specialists in every department of human knowledge. "The plan of 'The Century Dictionary' includes three things: the construction of a general dictionary of the English language which shall be serviceable for every literary and practical use; a more complete collection of the technical terms of the various sciences, arts, trades, and professions than has yet been attempted; and the addition to the definitions proper of such related encyclopedic matter, with pictorial illustrations, as shall constitute a convenient book of general reference." The result is a collection of about 225,000 words with their definitions and etymologies. Technical terms are a conspicuous feature, many thousands having been gathered which have never before appeared in any general dictionary, or even in special glossaries. These include not only names of organs, structures, functions, and processes, but a large proportion of

* The | Century Dictionary | An Encyclopedic Lexicon | of the English Language | Prepared under the Superintendence of | William Dwight Whitney, Ph. D., L. L. D. | Professor of Comparative Philology and Sanskrit | in Yale University | In Six Volumes. | Volume I [IV] | [Vignette] Published by | The Century Company. | New York. [1889-90.]

the systematic names of biology. "To the biological sciences a degree of prominence has been given corresponding to the remarkable recent increase in their vocabulary. During the last quarter of a century there has been an extensive reorganization and variation of the former systems of classification, from which have come thousands of new names of genera, families, etc.: and also a profound modification of biological conceptions, which has led both to new definitions of old words and to the coinage of many new words. All these terms that are English in form, and for any reason worthy of record, have been included, and also as many of the New Latin names of classificatory groups as are essential to a serviceable presentation of zoölogy and botany. The selection of the New Latin names in zoölogy has been liberal as regards the higher groups, or families, orders, etc., whether now current or merely forming a part of the history of the science; but of generic names only a relatively small number have been entered. Probably about 100,000 names of zoölogical genera exist, 60,000 at least having a definite scientific standing; but the whole of them cannot, of course, be admitted into any dictionary. The general rule adopted for the inclusion of such names is to admit those on which are founded the names of higher groups, especially of families, or which are important for some other special reason, or popular use, an established position in works of reference, the existence of species which have popular English names, etc."

The foregoing extracts from the preface indicate the scope and character of treatment of the ornithological names and subjects, in common with those of biology in general. The biological collaborators selected at once inspire confidence in the work, a critical inspection of which cannot fail to excite admiration.

We further learn from the preface that "The definitions of that part of general biological science which in any way relates to animal life or structure, including systematic zoölogy, have been written by Dr. Elliott Coues, who has been assisted in ichthyology and conchology by Prof. Theodore N. Gill, in entomology by Mr. Leland O. Howard and Mr. Herbert L. Smith, and in human anatomy by Prof. James K. Thatcher. Special aid has also been received from other naturalists, particularly from Prof. Charles V. Riley, who has furnished a number of definitions accompanying a valuable series of entomological cuts obtained from him." The botanical collaborators are Dr. Sereno Watson and Mr. Arthur B. Seymour (from A through G), and Dr. Lester F. Ward and Prof. Frank H. Knowlton (from G to Z). The pictorial illustrations are generally of a high grade, and are very largely made especially for the work. *

Four volumes of 'The Century Dictionary' have already appeared, the first three bearing date 1889, and the fourth 1890. The remaining two are announced to appear shortly. They are large quarto in size (type bed $7\frac{3}{8} \times 10\frac{1}{2}$ inches), and average over 1200 pages each. The ornithological

* Many of the illustrations of birds and mammals have been drawn by Mr. Ernest E. Thompson, from specimens furnished by the American Museum of Natural History.

matter, both as regards text and cuts, forms a conspicuous feature of the work, which is thus practically an encyclopedia of ornithology. For those who know Dr. Coues's ability at giving the gist of a bird's history in a few happily worded sentences, it is unnecessary to say that a vast amount of information is compressed into the space of a few lines. To cite a few illustrations: About 700 words are devoted to the word Grouse and two cuts, one representing the Scotch Ptarmigan, the other the Dusky Grouse of western North America. The history and etymology of the word occupies about 100 words, followed by a definition of the characters of the subfamily Tetraoninæ, with an enumeration of most of the species, under both their English and Latin names, with the principal synonyms of the former. In addition to this about 100 words are given to *Bonasa*, with a cut of our Ruffed Grouse; about the same to *Canace*, with a cut of the Canada Grouse; about 150 words are given to *Centrocercus*, with a cut of the Sage-Cook; under *Dendragopus*, this term is defined and a cross reference made to *Canace;* Ptarmigan receives about 200 words, with a cut of the Rock Ptarmigan, while nearly as much more is given under *Lagopus* with a cross reference to Ptarmigan; and so on for the other generic groups of the Tetraoninæ. This in fact may be taken as a fair illustration of the scope and method of treatment of ornithological subjects, most of the higher groups, including all of the more prominent genera, receiving from 50 to 200 words each, with generally a cut illustrative of some typical species of the group.

The amount of toil and tact involved in such an undertaking, it is easy to see, is almost beyond estimate, while the utility of such work cannot readily be over-appreciated. That in all parts it is equally good, or wholly beyond criticism, is not to be expected, but a careful examination of the work leaves us with the impression that an endless amount of labor and care has been expended, greatly to the advantage of not only the layman but to the trained specialist, particularly in fields outside of his own province. As a work of reference 'The Century Dictionary' must for a long time easily lead all competitors, it standing quite alone as regards scope, completeness, and fullness of treatment. — J. A. A.

Chapman on a Collection of Birds from British Columbia.* — The collection, of about a thousand specimens, on which this important paper is based, was made by Mr. Clark P. Streator between April 21 and Nov. 15, 1889, at several places in British Columbia and Washington. From June 16 to Sept. 3 he was in the comparatively dry country east of the Coast Range; the rest of the time he spent on or near the coast.

The paper opens with a brief description of the localities visited by Mr. Streator, together with a statement of the dates of his stay at each place, and then passes on to a discussion of the climatic regions in which they

* On a Collection of Birds made by Mr. Clark P. Streator in British Columbia, with Field Notes by the Collector. By Frank M. Chapman. — Bulletin of the American Museum of Natural History, New York City, Vol. III, No. I, Article VII. Author's edition issued Oct. 8, 1890.

lie, and of the effects of these climates upon the differentiation and distribution of the birds now found there. Mr. Chapman defines the moist coast region as having its eastern boundary "clearly determined by the mountains of the Coast and Cascade Ranges," and as extending northwestward to Kodiak Island, Alaska, and goes on to say: "In the present condition of our knowledge the southern limits of this region can be determined with but slight approximation. The abrupt lines which restrict the climatal conditions of the northern, eastern, and western boundaries are wanting on the southern boundary, and we have here a more gradual transition from the coast area of heavy rainfall southward into Southern California. . . . . On the Californian coast the southern limit of the northwest coast fauna may probably be drawn in the vicinity of Cape Mendocino, in Humboldt County, at about latitude 40° 30′, or near the annual isohyetal line of 38 in." In attempting to mark out a definite southern boundary of the 'Northwest Coast Region,' Mr. Chapman has run against the stumbling-block which lies in the path of everyone who tries to draw hard and fast lines that do not exist in nature. Such a dividing line must necessarily be purely arbitrary, for in reality there is no separation, one thing shades imperceptibly into the other. The change from the forms inhabiting the wet coast of British Columbia to their representatives that occur farther south, is a gradual one and keeps even pace with the change in climatic conditions. The farther south we go from Puget Sound the less strongly marked is the rich and deep coloring that characterizes the birds of that region. On the Oregon coast a difference already appears, in the region of Cape Mendocino it has become greater, about San Francisco the divergence from the typical forms is still wider, yet even here the affinity to the Northwest Coast races is very close. If, for the sake of convenience, we are to lay down imaginary boundaries where Nature has imposed no separation, it is probable that in the present case the line would have to be drawn somewhere between San Francisco and Santa Barbara. — not as far up the coast as Cape Mendocino.

Mr. Chapman further discusses the influence of the moist coast climate upon the differentiation of local races, and illustrates his remarks by a table of 31 characteristic coast forms contrasted with their representatives in the interior. In bringing about this differentiation he says: "heavy rainfall and humidity are primary factors, but the more immediate agents are the dense vegetation and clouded skies of a moist region which afford protection from the 'bleaching' rays of the sun." In other words it is simply a question of exposure to light, and the relative moisture of the atmosphere has nothing directly to do with the result. This is an assumption which may well be questioned.

Among other interesting things brought out by his study of these collections Mr. Chapman finds that species, which in the arid regions of the western United States are "differentiated from their Eastern allies, in several instances appear in British Columbia in a plumage which more nearly, if not exactly, resembles that of the Eastern form." Examples mentioned are *Chordeiles virginianus*, *Poœcætes gramineus* and *Spizella socialis*. It

may be possible that in these cases approximately similar climatic conditions have, as Mr. Chapman states, resulted in the development of similar characters, but is it not more probable that the likeness is due, at least in part, to a recent genetic connection with the true Eastern forms which in their northwestern extension across the continent exist not so very far to the northward of British Columbia. There are no impassible physical barriers to prevent such an origin of the birds in question, and may not a connection be to some extent still kept up by the occasional infusion of fresh blood of the Eastern form by means of an annual migration from the northward?

The author also mentions one or two instances where, among series fairly characteristic of the interior or of the coast forms, individuals occur showing strongly marked characters of an Eastern race. Why might not this too be the result of interbreeding with a stray migrant from the northward? It is generally believed that the bulk of the 'Eastern' birds inhabiting the Mackenzie Basin and the interior of Alaska migrate southeasterly, keeping to the eastward of the Rocky Mountains. The occurrence of stragglers of various species southward along the Pacific coast makes it seem not unreasonable that there should be a similar, though very limited, migration through the valleys of the interior, trifling, perhaps, in numbers, yet amply sufficient to account for such facts as these.

Following the introduction comes a formal list in which 160 species are considered in detail. "In every instance specimens have been received unless a statement is made to the contrary." Mr. Streator's field notes are usually brief, but of course are of much interest, coming from regions of which we have so little definite knowledge. Mr. Chapman adds in many cases important, and sometimes extended, technical notes bearing chiefly upon questions of geographical variation.

The paper ends with a table "giving the number of specimens of each species contained in Mr. Streator's collection, and also the localities at which they were obtained," thus showing exactly upon what material every conclusion of the author's is based. It would be a most desirable thing if other writers would follow this example of Mr. Chapman's The table is a fitting conclusion to an excellent piece of work, one that on more grounds than one takes rank as an important contribution to ornithology.—C. F. B.

Hagerup and Chamberlain's Birds of Greenland.* — This book, prepared by Mr. Chamberlain from material furnished by Mr. Hagerup, consists of two parts. The first, an annotated list of the 'Birds of Ivigtut,' is based upon a former paper by Mr. Hagerup published in the 'The Auk' two years ago (Vol. VI, pp. 211-218, 291-297). This has been revised and corrected, and includes the results of experience gained by Mr. Hagerup

*The | Birds of Greenland. | By Andreas T. Hagerup. | Translated from the Danish | by | Frimann B. Arngrimson. | Edited by Montague Chamberlain. | Boston: | Little, Brown, and Company. | 1891.—8°. pp. 62.

during a second stay of fifteen months at Ivigtut. The accounts of the breeding and habits of the birds contain much that is interesting, and some remarkable facts are brought out in regard to the migratory movements of certain species; considerable attention too is given to the changes of plumage of several of the species. There are unfortunately a few cases in which Mr. Hagerup seems to have neglected his opportunity of settling the status of some doubtful forms by the reference of large series to some high authority for determination.

The second part, a 'Catalogue of the birds of Greenland,' "comprises all the birds discovered up to date in that part of western Greenland which is settled by the Danes; namely, the country lying south of 73° N. lat." It "is based on the works of Holboll, Reinhardt, Alfred Newton, Ludwig Kumlien, and others; use has also been made of the late Alfred Benzon's collection of bird-skins and eggs," which has supplied much material especially in regard to times of breeding; and Mr. Hagerup's own experience has furnished its quota. The annotations are as a rule quite brief. "Of the 139 species here enumerated one [*Plautus impennis*] is extinct and 53 are merely accidental stragglers, while 24 others are so rare that they might be classed with the accidentals, leaving but 61 species that should be recognized as regular inhabitants of Greenland; and of these several are of quite uncommon occurrence. (M. C.)." Of the smaller land birds a majority are North American species entered as "chance visitors." The Catalogue is greatly benefitted by Mr. Chamberlain's critical notes though he has used his editorial privilege almost too sparingly. Explorers of Greenland, and indeed all who are interested in the fauna of this or other boreal regions, will find this work a most useful hand-book. —C. F. B.

Nicholson's Translation of Sundevall's 'Tentamen.'*—Mr. Nicholson has done good service in placing within the reach of English speaking ornithologists Sundevall's celebrated essay on the classification of birds, originally published in Latin in 1872. For a time, and in certain quarters, Sundevall's system met with much favor, though in many respects arbitrary and artificial; yet at many points it was an advance upon what had been done before. The essay opens with a preface, in which he explains the basis of his work as regards material examined, and makes several pertinent strictures upon the practices of some of his predecessors in respect to imperfect citation of names and references to localities whence specimens are derived. This is followed by the 'Introduction,' giving 'Remarks on the Development of the Ornithological System' (pp. 1-11); 'On the Notion of Affinity as a Principle of Natural Systems' (pp. 12-20); 'Concerning the Object of Systems in Natural History and the Properties involved in them' (pp. 21-25); 'Remarks on the Ornithological

*Sundevall's | Tentamen. | [Methodi Naturalis Avium Disponendarum | Tentamen.] | Translated into English, | with Notes, | By Francis Nicholson, F. Z. S., | Member of the British Ornithologists' Union, | Corresponding Member of the American Ornithologists' Union. | London: | R. H. Porter, | 18 Princes Street, Cavendish Square, W. | 1889.—8vo. pp. xiii, 316, with frontispiece (portrait of Sundevall).

Classification followed in this Work' (pp. 26-29); 'Remarks on Systematic Nomenclature' (pp. 30-42). Then comes the main body of the work, entitled 'An Exposition of a Method of a Classification of Birds' (pp. 43-252). Three pages then follow devoted to observations on certain genera of doubtful position in the system, and a page of corrections and additions. An 'Index to the Generic Names' mentioned in the work occupies pages 260-286; they number about 2400, of which 900 are considered as superfluous and 300 as synonyms. A list of 'Generic Names added or altered in this Work' follows. All this is followed by an 'Appendix' (pp. 291-305) devoted to 'Ornithographic Terms; or the names of the external parts of Birds,' illustrated with a plate. The translator has added various foot notes, "giving references to recent publications, in the hope that they may assist the student"; he has also added two appendices, the first giving a summary of Sundevall's system (by Mr. R. B. Sharpe, from the 'Zoölogical Record' for 1872), the second giving the outlines of Sundevall's later arrangement of the Accipitres and the Thrushes, both published in 1874, almost Sundevall's last work, his death occurring the following year.

The work thus contains much that the student of today may consult with profit, aside from the historic interest of the essay as one of the leading attempts at a natural classification of birds.

In the 'Remarks on Classification' are many passages of special interest, particularly his discussion of "the time from which the use of binomial nomenclature in Zoölogy ought to date." He says: "Generally the year 1766 is taken, being the date of publication of the twelfth edition of the 'Systema Naturæ,' which is also the one best known. . . . This is nevertheless an entirely false notion. This nomenclature is brought forward as a principle, and followed out through the whole Animal Kingdom, in the *tenth* edition of the same work, that published in 1758, and it really dates from that time This observation is the more important, because in this edition many species are a great deal better characterized than in the twelfth, where incorrect synonymy and other mistakes are often introduced, and where some species are entirely omitted. . . ." This in reference to specific names. Generic names in Zoölogy commence "with the first edition of Linnæus's 'Systema Naturæ,' published in 1735, this being the first work where genera form an essential part of a system of Zoölogy," etc.

As already said, we believe Mr. Nicholson has done good work in making Sundevall's important essay readily accessible to a large class of students who would be unable to make use of the original edition. The work is admirable in typographical execution.—J. A. A.

Goss's 'History of the Birds of Kansas.'*—As a handbook or manual of the birds of a definite area, Colonel Goss's 'History of the Birds of Kan-

* History | of the | Birds of Kansas | — | By N. S. Goss. | — | Illustrating 529 Birds. | — | Topeka, Kansas: | Geo. W. Crane & Co., Printers and Binders. | 1891. —Royal 8vo. pp. 692 + 1 l., and 35 photogravure full-page plates.

'sas' might in many ways serve as a model to future writers of similar works. As its title indicates, the work is strictly limited to the birds known to occur within the State of Kansas, which now number 343 species and subspecies. The technical descriptions are borrowed, "chiefly from 'North American Land and Water Birds,' by Baird, Brewer, and Ridgway," for which due credit is given. No synonymy or bibliographical references are included, further than is implied in the concordance, in which, in addition to that given in the A. O. U. Check-List is included a reference to the author's own 'Revised Catalogue' of Kansas birds, published in 1886, and to the A. O. U. Check-List itself. Nothing further is really necessary in a work of this character, the A. O. U. Nomenclature being strictly followed.

The character of the text is hence as follows: The characters of the higher groups are given in full, from the source already indicated. The text under each species consists of the A. O. U. Check-List names (both English and Latin), followed (1) by a reference to the plate where the species is figured; (2) a summary statement of the nature of its occurrence in Kansas; (3) its concordance; (4) its habitat; (5) technical description; (6) life history, based mainly on the author's own personal experience.

Colonel Goss has been a great wanderer in pursuit of ornithological knowledge, and it is a pleasure to find his pages on Kansas birds enriched by references to his experience with many of the species mentioned in the Gulf of St. Lawrence and the maritime Provinces of Canada, in Florida, Wisconsin, and Texas, on the Northwest Coast, and in various parts of Mexico and Central America. His bird biographies thus abound with fresh material, given in a most unassuming and very pleasant way. The descriptions of the nesting habits and the eggs are generally very full. His own experience, however, is supplemented in many instances by extended quotations from other authors. In general it may be said that the work adds greatly to our knowledge of many species of North American birds, and is in every way a credit to its conscientious and painstaking author.

Typographically the work is very attractive, while the plates are a novel feature, and, as an inexpensive method of illustration, may be regarded as a success, quite excelling in effectiveness any previous attempt at photo-engraving in ornithology we have seen. In fact, the plates are little less than a revelation respecting the possibilities of photogravure as an aid in ornithological illustration. The figures are all from mounted specimens in the 'Goss Ornithological Collection,' in the State Cabinet at Topeka and the work of Col. Goss himself. They are arranged in plates containing from five or six to twenty or more figures, grouped so as to be photographed all at one time, and thus all presented on practically the same scale. While the perches necessarily give a stiff and rather inartistic effect, the markings of the plumage and the general character of the birds come out with wonderful clearness and effectiveness, even in figures less than an inch in length. There are here and

there defects evidently due to haste or lack of care, as explained by the author in a note at the end of the volume. Much of the success attained is of course due to the excellent quality of the specimens as regards mounting, etc.—J. A. A.

A Forgotten Volume. — In looking through stores in New York where old books are sold, I lately came across a time-stained copy of the first volume of Audubon's 'Ornithological Biography' bearing on its title-page the following imprint: — Philadelphia: | Judah Dobson, Agent, 108 Chestnut Street; | and | H. H. Porter, Literary Rooms, 121 Chestnut Street. | MDCCCXXXII. A casual glance was sufficient to disclose that it was not the Edinburgh edition with the Philadelphia title-page (Philadelphia, E. L. Carey and A. Hart, MDCCCXXXII). Later, comparison with the Edinburgh has shown that the two are wholly distinct so far as typographical features are concerned. In the text there are slight verbal differences which tend to prove that this Philadelphia issue was printed before the one from abroad. I find no mention of this edition of volume one in the bibliographies I have access to. The attention of the Linnæan Society of New York was called to the matter and the book exhibited at a meeting in February. It has also been inspected by Mr. George N. Lawrence. To all, however, it was unknown. There is doubtless a story back of this volume, the recital of which cannot fail to be of interest to the curious bibliophile.—Leverett M. Loomis, *Chester, S. C.*

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GENERAL NOTES.

A Breeding Place of Pelecanus fuscus.—About the middle of March, 1882, while fishing and sailing on the Indian River, Florida, between Rock Ledge and the Indian River Inlet, my boatman took me to see a Pelican breeding place. The island where the birds *bred* was about two acres in extent, as near as I can remember, and not far from the east shore of the river. It was opposite a point on the west bank of Indian River, some two miles or more below the mouth of the St. Sebastian River. As the tide was low we pushed our boat as far up towards the land as we could, and waded ashore in the mud; landing through a gap in the low mangroves that fringed the island.

A dense mass of birds had risen at our approach and spread out over the island like a cloud. This great flock was joined by the laggards as we walked about; and the rush and roar of the flapping wings was tremendous. There were hundreds of birds in the air—perhaps a thousand. In tramping about, it was difficult to take a dozen steps in any one direction without treading on empty nests, fresh eggs, or young birds. Every stage of development was seen, from the new egg to the downy, ridiculous, full-grown young ones. The guano was so deep on the ground that

all vegetation near it was killed. Nearly all the trees and bushes above water line were dead or dying from this manure.

I remember seeing no other bird than the Brown Pelican. Unfortunately I took no notes at the time, but perhaps this imperfect account may be of some value as I hear the hatching places there are getting very scarce.—Robert H. Lawrence, *P. O. Humptulips, Washington.*

The Whistling Swan in Massachusetts.—I have lately purchased a Whistling Swan (*Olor americanus*) of Frazar Bros., the Boston taxidermists, who received it in the flesh from Michael McCarthy of Auburndale by whom it was killed December 17, 1890, in Weston, Massachusetts. It is a male, apparently an old bird for the plumage is perfectly free from grayish although somewhat soiled, perhaps by handling after death. Mr. McCarthy has given me the following account of the circumstances attending its capture:

He was walking along the west bank of Charles River near Norumbega Tower at about half past six o'clock in the morning, looking for ducks, when he saw seven large white birds within a yard or two of the shore in a bay where the water was perhaps two feet deep. They were apparently feeding on the bottom, thrusting their heads and long necks under the water every few seconds. He succeeded in getting within about seventy-five yards of them and fired, killing one, when the others at once rose and flew out of sight, following the course of the river towards Waltham, two, which were probably slightly wounded, lagging behind the rest. All looked pure white like the one captured. The latter weighed seventeen pounds. The morning was cloudy with an east wind which brought rain about noon. There was a little ice in the middle of the river but the water along the shores was perfectly open.

Charles River at the place where these Swans were seen is a broad, sluggish stream, expanding in a succession of bays and bordered on both banks by nearly unbroken stretches of woods.

There are three previous records of the occurrence of the Whistling Swan in Massachusetts within recent years, the first (Bull. Nutt. Club, III, 1878, p. 198) of a bird taken by F. P. Chadwick, March 4, 1878, on Coskata Pond, Nantucket; the second (Bull. Nutt. Club, IV, 1879, p. 125) relating to a specimen in the collection of the Boston Natural History Society which is supposed to have been shot at Nahant by a Mr. Taylor about the year 1865; and the third (Bull. Nutt. Club, VI, 1881, p. 123) of a flight of five birds seen passing over Somerset, October 16, 1880, by Mr. Elisha Slade.—William Brewster, *Cambridge, Mass.*

The Green Heron (*Ardea virescens*) Wintering in South Carolina.—On December 16, 1890, I was very much surprised to see a Green Heron. As I wanted to see if the bird would really winter, I refrained from shooting it. I saw the bird again on January 9, 1891, and several times during the middle and latter part of the month. The last time I saw the bird was on February 13. This is the first instance I have of the Green Heron wintering.—Arthur T. Wayne, *Mount Pleasant, S. C.*

Some Rookeries on the Gulf Coast of Florida.—In a late number of 'The Auk' (Vol. VII, p. 221) Mr. W. E. D. Scott states that "there are absolutely *no Heron rookeries* on the Gulf coast of Florida, from Anclote Keys to Cape Sable." Mr. Scott has overlooked at least one rookery of fair size.

From April 19 to May 9, 1890, I was cruising along the Gulf coast, starting from Little Sarasota Bay, going as far as Ten Thousand Islands, and returning to the point of starting. My object was to take eggs of the various species said to breed along the coast. Moving along leisurely, rarely making more than twenty miles a day, the shore and islands were examined very closely.

Going south the only rookery noticed was one at the entrance to Charlotte Harbor, east of Pine Island; it was on a small mangrove island, and only Brown Pelicans and Florida Cormorants were breeding on it, probably four or five hundred pairs. Another one, also of Pelicans and Cormorants, about a hundred pairs I judged, occupied a mangrove island about fifteen miles southeast of Cape Romano.

On returning northward Pine Island was passed on the west side, through San Carlos Bay. A Pelican and Cormorant rookery on a small mangrove island was examined, and more than two hundred nests were counted on it. Opposite Captive Pass I was attracted to a mangrove island about two hundred yards long and a hundred yards wide by seeing a large flock of Frigate Pelicans circling about high above it. The boat was pointed towards it and on nearer approach several Herons were seen flying to and from the island. It was covered with mangroves, red and black species, tall slender trees forty feet in height. About sixty or seventy Herons' nests were examined, not more than a fifth of the number seen; the two species breeding were the Louisiana Heron and the Reddish Egret. One Egret's nest was found to five of the Louisiana Heron. The majority held young birds at this date, May 3. Many Cormorants also were nesting with them but no Brown Pelicans' nests were found and none of the Frigate Pelicans'; none of the latter alighted on the island while I remained.

Ten nests of the Great Blue Heron, two holding young ready to fly, were noticed on a small island two or three miles from the heronry; about fifty pairs of Cormorants were nesting with them.—H. K. Jamison, *Manayunk, Philadelphia, Pa.*

Migration of the Red Phalarope (*Crymophilus fulicarius*).—During a four weeks' cruise to the Gulf of St. Lawrence last spring, I gained considerable information concerning the migration of the Red Phalarope. I sailed from Gloucester on May 24, and the first Phalaropes were seen on the following day, being more or less abundant until reaching Cape Breton Island. They were not again seen until, passing Cape North, we entered the Gulf of St. Lawrence. The exact position of the first birds seen was lat. 43° 2′, long. 69° 13′, or 132 miles W. by N. of Seal Island on the Nova Scotia coast. At this point seven were seen at 11 A.M.,